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ABSTRACT

The University of Alaska, Juneau (UAJ), is the center for the University of Alaska Southeast and includes both a senior college and a community college. Most of the university facilities within the Juneau area are on the Auke Lake Campus, approximately 12 miles northwest of central Juneau. This report delineates the location of the campus, then briefly describes the scope and intent of this plan as it relates to the University's comprehensive master planning program. A brief description of the philosophy and objectives of both the University and its consultants follows, and the history of the University and stated objectives of the University of Alaska Southeast are reviewed. An analysis of existing conditions is presented that includes land use, zoning, ownership, utilities, soils, slopes, climates, and visual qualities of the site. Planning ratios in terms of square feet per student are established as guidelines for development of the campus. Site utilization guidelines are set and the mix of building types is established. Design proposals for development of the site are presented that provide a circulation and parking pattern, a proposal for utility distributions and height zones, and a conceptual site development plan in three phases. The report concludes with a series of recommendations made by the consultants that cover transportation, density of development, and architectural character. (Author/MLF)

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AUKE LAKE CAMPUS
SITE DEVELOPMENT PLAN

A preliminary plan for the Auke Lake Campus, University of Alaska, Juneau which evolves from a thorough analysis of the existing campus and includes: theme statements, planning factors and siting guidelines.

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ABSTRACT

The University of Alaska's statewide system includes three major administrative and instructional divisions. There are two senior colleges, one four-year senior college and ten community colleges at various locations throughout the State. The University of Alaska, Juneau (UAJ), is the center for the University of Alaska Southeast and includes both a senior college and a community college. Most of the university facilities within the Juneau area are on the Auke Lake Campus, approximately 12 miles northwest of central Juneau. As of the spring of 1976, there were three buildings on the Auke Lake Campus, and another planned for construction during the 1976 building season. Since most of the University's new buildings will be on the Auke Lake site, the purpose of this Site Development Plan is to provide basic concepts to direct construction during the next few years. The University long has recognized its responsibility to the Juneau community and, in particular, to its neighbors in the Auke Bay area. The intention of this Site Development Plan is to establish a pattern to insure a certain measure of predictability to the University's schedule of construction in the area. The plan was developed for the University of Alaska, Juneau, by the Office of Institutional Studies and Physical Facilities Development with Kramer, Chin & Mayo, Inc. (KCM) as consultants to the University.

The Site Development Plan first delineates the location of the Auke Lake Campus, then briefly describes the scope and intent of this plan as it relates to the University's comprehensive master planning program. A brief description of the philosophy and objectives of both the University and its consultants follows, and the history of the University and stated objectives of the University of Alaska Southeast are reviewed. The goals of this Site Development Plan are then set out.

An elaborate analysis of existing conditions is presented. This basic data is used as the base for the design and development decisions which are presented later. The existing conditions analysis includes: land use, zoning, ownership, utilities,

soils, slopes, climates and visual qualities of the Auke Lake site. Next, the report addresses the question of size. From population projections for growth in both Alaska and the Southeastern Region, a rough demand curve for educational space is projected. By comparing Pacific Northwest colleges of a size comparable to the UAJ, planning ratios in terms of square feet per student are established as guidelines for development of the campus. A comparison is made of site utilization upon other urban and suburban campuses, and site utilization guidelines are set for the Auke Lake Campus. Those spaces for which development is proposed are then broken down according to University of Alaska *Design Guidelines,* and the mix of building types is established. Design proposals for development of the site are then presented. The design proposals provide: a circulation and parking pattern, a proposal for utility distributions and height zones, and a conceptual site development plan in three phases. The design proposals attempt to utilize as much as possible the excellent vistas and unique, natural characteristics of the site. The purpose of these development schemes is to indicate possible ways in which the University can locate new buildings in the Auke Lake area. The report concludes with a series of recommendations made by the consultants, which cover such diverse subjects as transportation, density of development and architectural character.

In summary: The Auke Lake site is an extremely unique and beautiful location for a University facility, and the utmost care and sensitivity will be required while developing the campus in order to respect the natural land forms and vegetation as they currently exist. The University is intent upon pursuing a developmental pattern which will recognize the natural beauty of this site, so the Auke Lake Campus will not only be a significant amenity for University students and faculty but also a source of pride and an important economic asset to the Juneau community.

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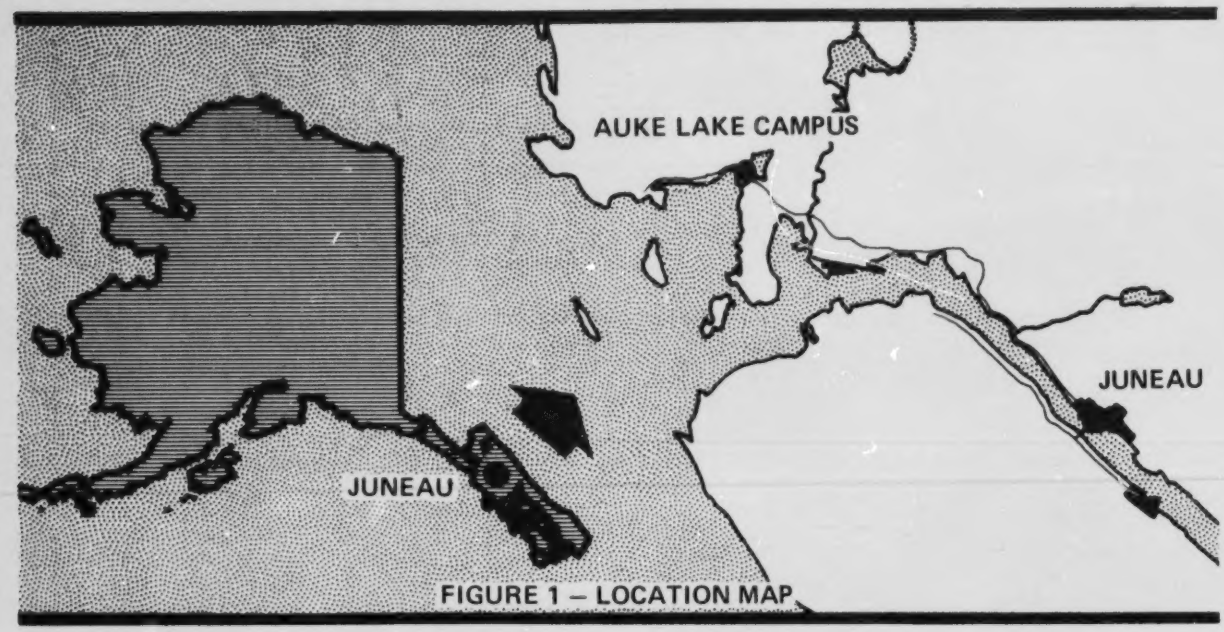

FIGURE 1 – LOCATION MAP

1. The Challenge

SITE LOCATION

The city and borough of Juneau are situated in the southeastern part of the State of Alaska, in what is commonly referred to as the "Panhandle Region." Both are operated under a unified home-rule governing system.

Juneau is located on what is known as the Inside Passage, 1,090 miles north of Seattle with a flight time of 2 hours from Seattle and 1-1/2 hours from Anchorage. As is true of most communities in the southeast, the only access to Juneau is by air or water. The general topography of this area is steep, mountainous and heavily wooded.

The current population of the greater Juneau area is approximately 17,000. Growth should reach about 20,000 by 1980. Now the capital of Alaska, Juneau has been the seat of territorial and state government since 1906. Juneau historically has had a tight labor market on a year-round basis, and the lowest unemployment rate of any region in Alaska. Most employment in Juneau is in the area of professional and governmental service.

The Borough, which covers more than 150 square miles, is divided into several areas: metropolitan, Douglas, Auke Bay, Juneau Airport and Mendenhall Valley.

The Auke Lake Campus of the University of Alaska, Juneau (UAJ) is located approximately 12 miles northwest of downtown Juneau on the Glacier Highway in the Mendenhall Valley. The Juneau Airport is three miles southeast of the campus. The Mendenhall Glacier, approximately five miles to the northeast directly across Auke Lake, can be seen from the campus. The residential area near the campus is being built up rapidly with new subdivisions. The campus is situated at the leading edge of building developments west of Juneau. Further west of the campus site are the Auke Bay recreational areas, and the Tongass National Forest, that completely surrounds Juneau.

The Auke Lake Campus currently consists of about 34 acres. Three buildings, and two parking lots with a total capacity of 80 cars, have already been built. Future plans include the addition of a new Vocational-Technical building in 1976 and a Fisheries Science Facility, to house the University's new Division of Fisheries, scheduled for completion soon afterwards. In general, the analysis in this report is confined to the area surrounded by Glacier Bay Highway and the Mendenhall Loop Road. See Figure 2.

The UAJ currently is constructing a downtown center, and uses existing buildings in downtown Juneau. Although the University has scattered land holdings in other areas of the Borough, the greatest concentration of growth for the University will be on the Auke Lake Campus site. Because previous planning studies (George Filler, 1974) indicated that the Auke Lake site was the most suitable of those considered in the Juneau area, this Site Development plan is confined to the area imme-

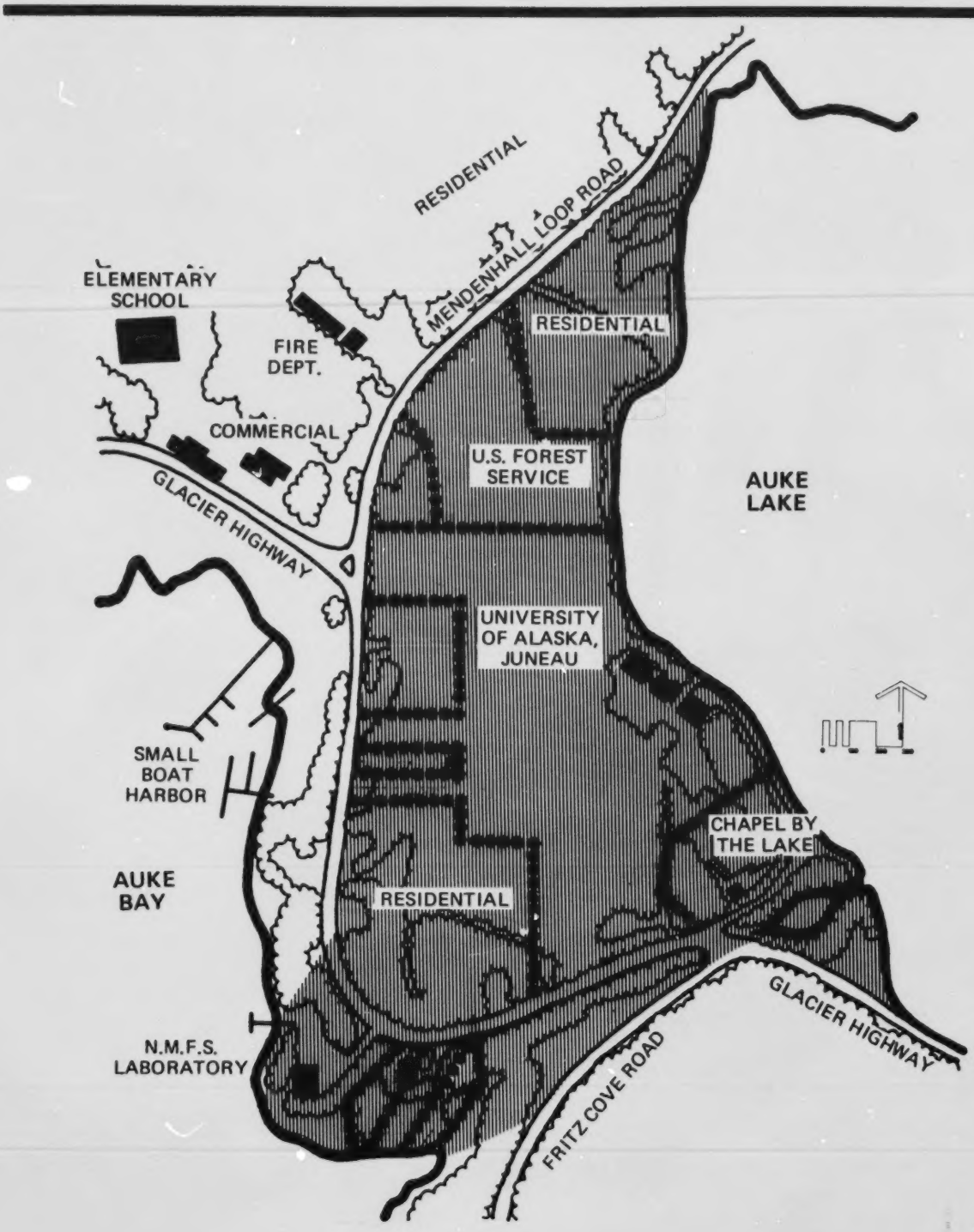

FIGURE 2 – STUDY AREA

IDENTIFIABLE ELEMENTS
COMPREHENSIVE MASTER PLAN PROGRAM

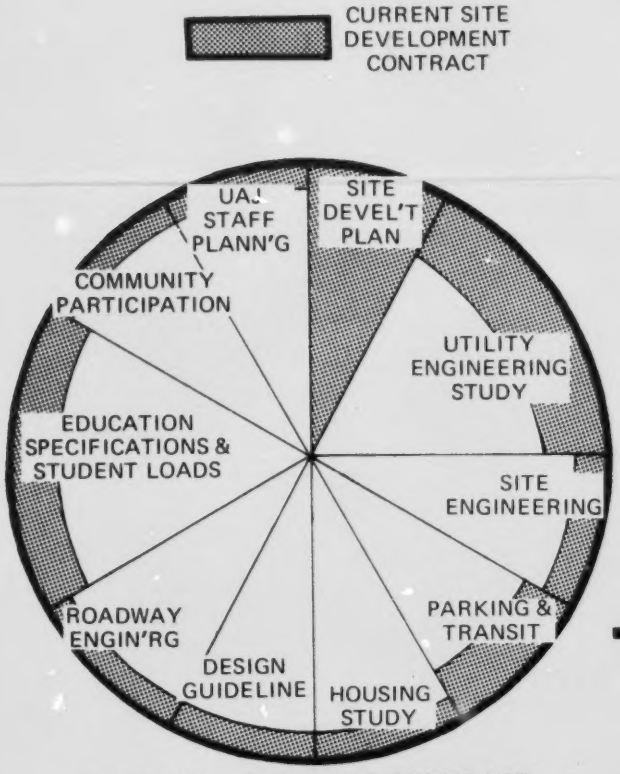

FIGURE 3 – PLANNING CONTRACT

diately around the land which the University presently owns on Auke Lake.

SCOPE –
SITE DEVELOPMENT PLAN

The comprehensive master plan for the UAJ, including the Auke Lake Campus, has many component parts. Some of these parts are shown on the pie chart diagram in Figure 3.

The purpose of this Site Development Plan is not as a substitute for a comprehensive master planning program but to be used to help start the Comprehensive Plan. The Site Development Plan touches briefly upon all areas which normally would be analyzed in greater depth in the Comprehensive Master Plan, and concentrates on the specific site considerations. This Site Development Plan, then, gives only basic guidelines to set some of the groundwork for the continuing, ongoing planning tasks at UAJ.

The table in Figure 4 lists the main objectives of the Site Development Study as proposed to the University of Alaska planners by KCM in October of 1975. At that time, the scope of this Site Development Plan was stated as follows:

"This preliminary plan (Site Development Plan) would be sufficient to direct the first phase construction including building locations, street layout and utility services. It would briefly address the questions of land acquisition, existing master plans and educational programs. A theme statement for the campus will establish the philosophical basis for future expansion decisions.

The site analysis will be minimal because of budget restrictions and depend upon past studies. Emphasis for the site analysis will be upon existing topography, vegetation, eco-systems and climatological data. The design of the campus will be presented in a series of large maps showing clearly the size relationship of main building groups, roads, parking, recreation facilities and vegetation masses."

FIGURE 4 – SITE DEVELOPMENT STUDY

- **FIRST PHASE CONSTRUCTION–IMMEDIATE**
  - Building Locations
  - Street Layout
  - Utility Services
- **LAND ACQUISITION**
  EXISTING MASTER PLANS
  EDUCATIONAL PROGRAM/
  STUDENT LOADS
- **THEME STATEMENTS**
  - Philosophical Expansion Plan Base
- **SITE ANALYSIS–MINIMUM**
  - Topography
  - Vegetation
  - Eco-System
  - Climatology
- **LARGE GRAPHICS**
  - Size Relationships of Main Building Groups, Roads, Parking, Recreation Facilities, Vegetation Masses

Since this scope statement was written, the project has progressed and several areas of emphasis have been modified. Land acquisition questions have become less important as campus growth has developed from design decisions. The site analysis, while originally seen as being minimal, has been expanded because it contains information which is basic to the design decision-making process.

While opinions and concepts presented in this report are those of the consultant, KCM, they represent in general the direction that the University plans to take in developing the Auke Lake Campus. Any document of this type is a dynamic entity and not a static statement. The Site Development Plan will be changed and altered as the basic principles which went into this plan change, and situations which are now only projections become more clearly understood. This document is an attempt to present a logical process whereby design decisions have been made based upon a build-up of information. It is also an attempt to impose a system of discipline upon the improvements to be placed on a particular piece of land, in order to achieve a desirable goal. While this system of discipline sets down guidelines for the future, these guidelines are neither to be used without modification nor are they to be capriciously ignored. An important function of the Site Development Plan is to provide a certain amount of predictability to the University's development in the Auke Lake Campus area. The proposals presented in this Site Development Plan should be altered only for good reasons. This is not to say "Don't change the plan"; rather, "Change it only when there is an opportunity to make it better."

2.Theme Statements

UNIVERSITY HISTORY

July 4, 1915, the Honorable James Wickersham, delegate to Congress from Alaska, laid the cornerstone on land set aside by Congress for the support of a land grant college. In 1917, the Territorial Legislature accepted the land grant and created a corporation, "The Alaska Agricultural College and School of Mines," with an eight-member Board of Trustees. The college opened for instruction in 1922 and became the University of Alaska in 1935. At that time, the Board of Trustees was renamed the Board of Regents. The University offered its first summer sessions in 1947, and Dr. Robert W. Hiatt became the University's fifth President in 1973.

Today, the University is a statewide system which includes regional centers with senior colleges at Fairbanks, Anchorage and Juneau, and community colleges at Anchorage, Bethel, Fairbanks, Juneau, Kenai-Soldatna, Ketchikan, Kodiak, Palmer and Sitka. In 1966, the University implemented a plan for de-centralization of the statewide system and the Southcentral Region was established. The regional concept was adopted by the Board of Regents in 1964 and by July 1, 1972, the Southeast Region was activated fully and a resident provost was appointed.

From the very beginning, because of the eight, widely separated population centers in the Southeast Region, it was apparent that the University's educational programs in the Southeast Region would require a non-traditional approach. One of the first steps was to establish a service area concept. The region was divided into three equal service areas and each community college was given the responsibility for all lower division work in its area. The southeastern senior college recognized at the time of regionalization was given region-wide responsibility for all upper division and graduate work. The service area concept has provided an adequate population base for the development of community and senior college programs. There is also an integration in vocational and academic programs within the region. The regional organization structure reduces the need for a large administrative staff, keeps faculty in a position of awareness of student needs across their subject field, and keeps decision making at an operational level. The regional administrative philosophy is one of a team approach to administration and management.

PURPOSES

Goals for the U. of A. Southeast are found in the system-wide statement of purposes of the University of Alaska. In support of these purposes, the U. of A. Southeast is committed to: 1) developing educational programs that promote educational justice, and 2) maintaining a posture of service to the learner. Figure 5 quotes the catalog for the U. of A. Southeast, and lists the goals which have been established for fulfillment of the University's mission.

FIGURE 5

GOALS FOR UNIVERSITY OF ALASKA, SOUTHEAST

- Develop educational, public service, and research programs that have a special significance to Southeast Alaska.
- Assist and support each Southeast college to develop its own identity and direction.
- Develop and implement a delivery system for needed post-secondary educational programs that reaches out to residents in both urban and rural areas.
- Maintain a quality of excellence in all areas of educational effort and support services.
- Recognize the diversity of students and provide a wide range of programs and learning methodologies that will meet student needs.
- Provide open access to all students who can benefit from available educational opportunities.
- Provide and encourage life-long learning opportunities among adult students.
- Through available educational programs, provide students the opportunities to develop vocational and professional competencies.
- Whenever feasible, utilize community resources in planning and operating educational programs.
- Through a variety of educational programs and publications, provide information for living in Alaska.
- Encourage the Southeast colleges to be in and of their communities, and to become the educational and culture resource centers to their publics.
- Through the utilization of available University resources, assist community groups in the study and solution of problems and in the development of other community resources.

FROM: UNIVERSITY OF ALASKA, SOUTHEAST
1976–77 CATALOG

It is important to emphasize two aspects of these goals. The Southeast does not view itself in the traditional university mode, where the University establishes certain courses of instruction and then recruits students to fit the University's programs. Rather, the University considers itself an educational resource, where members of the community would come to the University as potential students seeking educational experiences, and the University would be prepared to respond to these educational needs. This goal and educational organization require a higher degree of flexibility and a clearer understanding of the needs of future students. Secondly, and in conjunction with this flexible educational concept, the goals require close contact between the University and the community which it serves. As a public resource attempting to respond to the educational demands of the citizens within its service area, the University is dedicated to maintaining close links with the community at all times.

UNIVERSITY OBJECTIVES

The objective of utilizing the UAJ Campus as a tool for the educational development of Alaskan citizens has been established by the University. Alaska is unique for the pride its citizens have for their state, and the University of Alaska shares this pride. While it has often been expressed as "Alaska for the Alaskans," in order that the UAJ be an effective community-senior college, an interaction between the University and an integration of its students into the City of Juneau is essential.

The University also has established an objective that encourages a high degree of interaction between specialized departments on the campus. In order to achieve the benefits of a mutual interaction between departments, all members of the college community would have to have accessibility to the different schools available on the campus. The encouragement of this interaction once again stems from the University's desire to be a community resource for furthering an individual's educational objectives.

Lastly, although the Juneau Campus shares many basic characteristics with all University of Alaska campuses throughout the system, the very nature of this particular campus is unique in its emphasis on local resources. The physical facilities available at the Auke Lake Campus should emphasize the local character and intrinsic talent available in the Juneau area.

AREA DEVELOPMENT

As part of the research done while preparing this report, the University planners and their consultants discussed the Borough's plans for the Auke Bay area with officials in the Juneau Borough Planning Office.

The impacts listed in Figure 6 have been identified as a basis for evaluating long-range development in the Auke Bay area.

FIGURE 6

IMPACTS ON LONG-RANGE DEVELOPMENT

- Improvements in intra-borough, public transportation systems will make this area more accessible and a more integral part of the Juneau metropolitan area.
- Auke Bay will be influenced directly by borough-wide population growth and urbanization pressure.
- Auke Bay will benefit indirectly as Juneau benefits from advancement in the technology of interstate and international transportation of commodities and services.
- An adequate supply of potable water and an environmentally sound and efficient method of waste disposal must be developed, perhaps in cooperation with the expansion at Auke Lake campus.
- If the State Capitol moves, it will put more pressure on the University to expand as part of the Borough's economic diversification plan.

FROM: *MENDENHALL VALLEY PLAN*, PART OF JUNEAU CITY/BOROUGH COMPREHENSIVE PLAN, 1974

Certain planning objectives can be identified for use by both UAJ and the Borough Planning Office. These are as follows:

1. Foster the orderly development of the study area by identifying and designating an integral pattern of land uses compatible with the future expansion plans of UAJ.
2. Encourage the adoption of local policies, planning principles and regulations in order to accomplish the intent of the future Comprehensive Plan.
3. Preserve and enhance the environmental quality available to the study area by encouraging a harmonious relationship between urban development and natural amenities.
4. Encourage a variety of residential development with convenient access to employment, shopping, school, UAJ, recreation and cultural facilities while assuring a safe, quiet and attractive community.
5. Encourage the development of commercial services geared directly to the expanding needs of the study area as well as those of the University.
6. Encourage concentration and unity of industrial development away from the waterfront to assure compatibility of land uses.

General goals and needs have been identified for planning purposes in the recently published "Goals for Juneau" questionnaire results. Those pertaining most closely to Auke Bay and its environs have been compiled in Figure 7

FIGURE 7

GOALS FOR JUNEAU

- Concept of continued moderate growth.
- Support for mini-bus system, as well as improvement of area-wide transportation system.
- Support of Marine Highway System, but not for development of Auke Bay terminal.
- Cluster residential subdivisions and duplexes mixed with single-family residences.
- Support of area-wide police and fire services.
- Preserve shorelines for water-dependent or water-related facilities.
- Strong support for more parks, recreation and open space.
- General interest in a convention/recreation center.
- The best features of living in the City and Borough are considered to be the natural

environment and outdoor recreation opportunities.

- Positive interest in social services, such as day-care facilities, senior citizens center, culture center, etc.
- Needed utility improvements are not keeping pace with growth in the Borough.
- Commercial area adjacent to airport should become a major retail area.
- Keep land beyond Tee Harbor in its rural state if pulp mill is not constructed.
- Reserve State, Borough and City land in Auke Bay for residential development.
- No industrial development along Auke Bay shoreline.
- Of the most available recreational activities, boating, hiking and cross-country skiing are the most popular.
- Inhabitants of the Borough would most like to live in Mendenhall Valley and Auke Bay, in that order.

FROM: *GOALS FOR JUNEAU*
QUESTIONAIRE RESULTS

PLANNERS' OBJECTIVES

As planners, our objectives throughout the development of this Site Development Plan have been to provide a campus environment that is conducive to interaction among students, between students and faculty, and most important, between students and the community. Our first assumption is that the University will draw a large percentage of its initial student-load from the Borough of Juneau area. These students, as community members, will create a strong tie between the UAJ and the Borough. The campus master plan also should facilitate this strong tie. In addition, the architectural end-product must respond to the unique physical features of the land and the impact that new construction will have upon the community adjacent to the site. It is our overall objective to provide a plan which will take maximum advantage of the natural beauty of the site, and reduce to a minimum the adverse impacts upon the Auke Bay community. In this way, the University can successfully meet its objectives of relating to the surrounding community and serving the needs of its students/citizens.

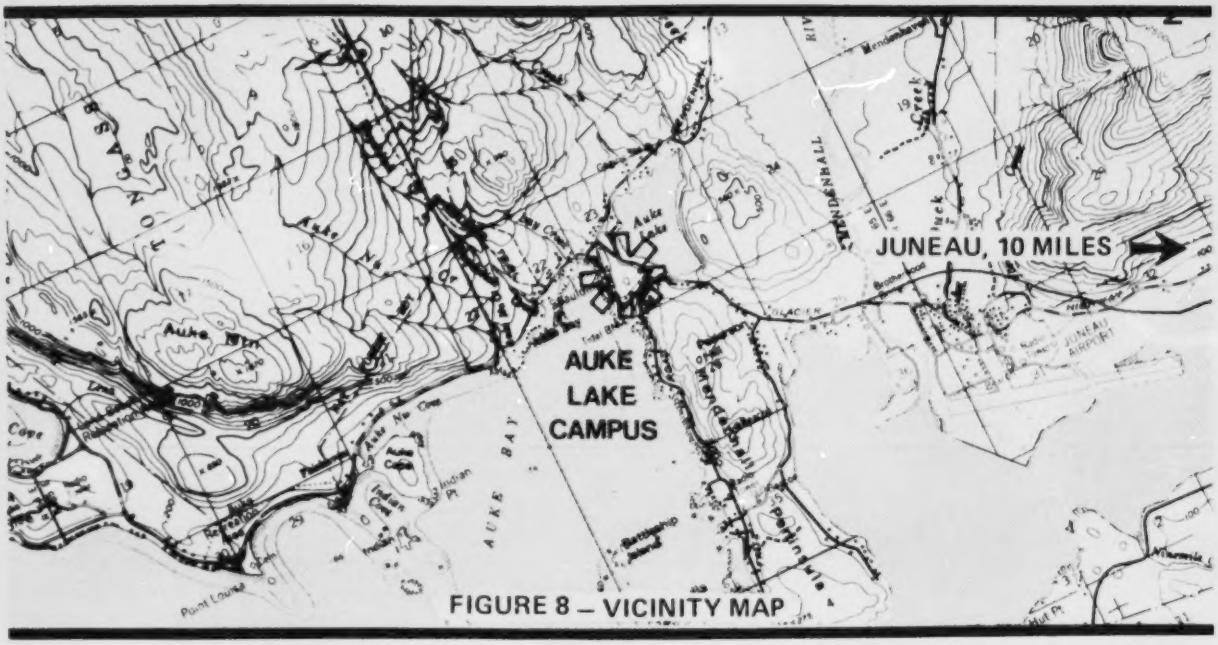

FIGURE 8 – VICINITY MAP

3.Existing Conditions

AUKE BAY COMMUNITY

The Auke Bay area contains an interesting mix of steep topographic features and many different man-made improvements. The area is unique because many freshwater lakes, streams with established salmon runs and also a large, protected saltwater bay are in close proximity to the area.

Currently there are approximately 1,200 people residing in the neighborhoods around Auke Bay. In the center of this community are the commercial buildings located near the intersection of Glacier Highway and the Mendenhall Loop Road. Near this intersection are the post office, fire station, an elementary school, and the small boat harbor with a small grocery store.

The area is primarily residential and is on the leading edge of a fast-growing suburb of Juneau. In the past, houses were built mostly along the right-of-way of the major highways; new subdivisions have been plotted and are filling in with new houses. The Auke Bay area is defined by the Borough Planning Department as service area No. 4, extending from the Mendenhall River on the east to Point Louisa on the west and the Tongass National Forest to the north and Auke Bay to the south.

At the core of the community are recreation- and water-oriented activities and facilities, such as a small boat harbor, sport fishing, pleasure boating float plane base, sightseeing and the ferry terminal. Changes in this ferry terminal are now being considered by the State Department of Public Works and plans are uncertain at this time. The Auke Bay community center includes the University of Alaska Juneau, Auke Lake Campus and the National Marine Fisheries Service laboratories.

Estimates are that the population of the Auke Bay area may climb to 3,100 by 1995, with the community's total holding capacity estimated to be about 12,500 people (Homan Assoc. 1974). This holding capacity assumes that all existing land which is zoned for residential use, and can be built upon, will be fully utilized. The elementary school, new sewer system, electrical and telephone systems, commercial services and post office, all presently in the area, will encourage the projected population increases.

The Borough Planning Department will be re-evaluating population and development pressures as they apply to transportation, industry, commercial and residential growth patterns in their upcoming Comprehensive Plan. Several possible new construction projects which may influence growth in the Auke Bay area include: the Berners Bay mill, a Juneau-Haines highway with a ferry connection, additions to the University of Alaska Auke Lake Campus, Marine Highway system dock

improvements and the future sewer connection to the Mendenhall treatment plant.

The existing land-use table shown in Figure 9 summarizes how land currently is being utilized. Notice that combining 1,397 acres of unsubdivided land and 474 acres of subdivided land for a total of 1,868 acres, creates a potential for an increase in population of about 11,200 people in addition to the existing 1,200 residents.

FIGURE 9 – CURRENT LAND USE

EXISTING LAND USE	ACRES
Residential	
· Single family	949.03
· Duplex	1.62
· Multiple	4.26
· Undeveloped, unsubdivided	1,397.43
· Undeveloped, subdivided	474.24
Commercial	58.26
Industrial	14.47
Religious	9.33
Public (schools, fire stations, etc.)	57.59
Semi Public (legion halls, etc.)	1.52
Streets and Highways	205.78
Unbuildable	945.62
Unselectable Lands	271.82
Wasted Land (FAA, UAJ, dedicated public open spaces)	144.96
TOTAL	4,535.93

FROM: PRELIMINARY STATEMENT, UPDATING THE COMPREHENSIVE PLAN FOR AUKE BAY, JUNEAU CITY/BOROUGH PLANNING DEPARTMENT, 1974

AUKE LAKE CAMPUS

The University of Alaska presently owns about 34 acres of property adjacent to and west of Auke Lake. See Figure 10.

This property is the site of the University of Alaska, Juneau. The site is situated on a hillside which affords commanding views of Auke Lake, Auke Bay and the Mendenhall Glacier, while also possessing the amenities of a rural forest setting. The following detailed analysis of the Auke Lake site establishes the basic information base for future development decisions. With this information in mind, the planning can proceed, and planners can have a reasonable degree of confidence that buildings will be located on good soil; development will be compatible with surrounding functions and the design work will not turn up any unpleasant surprises concerning the site.

Land Use

The existing land use surrounding the proposed Auke Lake Campus site is a combination of commercial uses, undeveloped, Federal government-owned and mixed residential property.

There is a church on private property adjoining the southeast corner of the existing UAJ site. The entrance of the campus now goes through the church property on a right-of-way easement. The University and the church are negotiating a land trade which would give the church permanent access to Auke Lake, while the University will acquire land for parking near the existing educational buildings.

Further southeast of the campus entrance road and across the mouth of Auke Creek, is a triangular piece of land, labeled on Figure 11 as "quasi-public," which is being used as a park and roadside turnoff. Originally the Glacier Highway crossed Auke Creek on a bridge at the mouth of the creek, near Auke Lake. This bridge was removed when the highway was moved to its present location.

Due south of the Glacier Highway, Auke Creek nearly parallels the roadway as it flows from Auke Lake into Auke Bay. The creek runs through a rock canyon with heavy tree cover. A small fish hatchery is located on Auke Creek. The future site of the University of Alaska, Division of Fisheries, is south of Glacier Highway. The buildings proposed for this site will occupy about 28,000 gross square feet and when completed, after a construction program which is planned to extend over several years, the facility will accommodate about 125 students and 10 faculty members. The National Marine Fish Service Laboratory (NMFS Lab) adjoins the University's proposed Division of Fisheries site. The NMFS Lab was built about 15 years ago and employs about 55 permanent and 35 temporary persons who carry on a comprehensive research and experimentation program for the Federal government.

The western edge of the Auke Lake site pre-

BASE MAP FROM: UNIVERSITY OF ALASKA,
OFFICE OF INSTITUTIONAL STUDIES AND
PHYSICAL FACILITIES DEVELOPMENT

FIGURE 10 – LAND OWNERSHIP & PARCEL SIZE

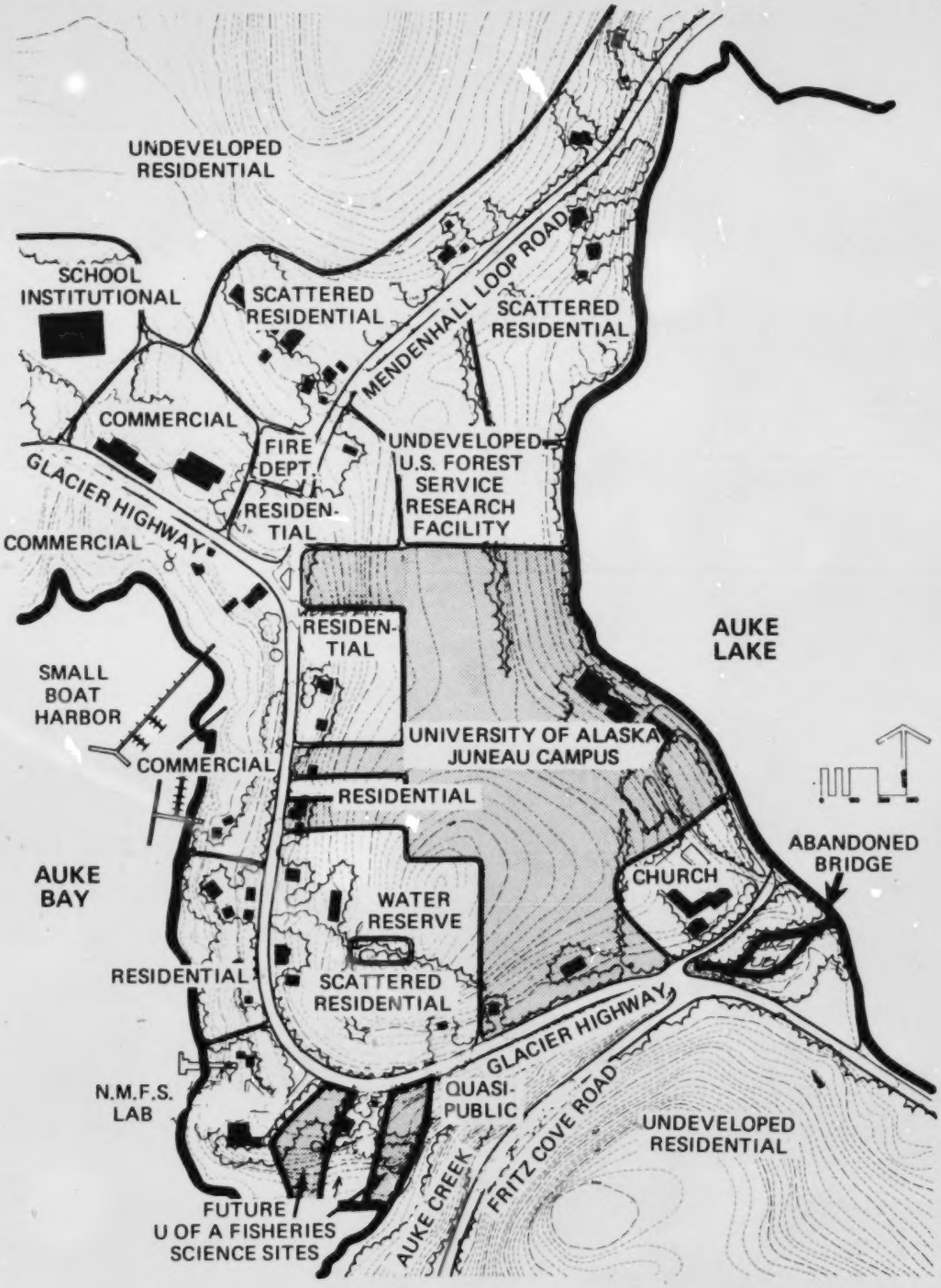

FIGURE 11 – EXISTING LAND USE

sently contains long, narrow residential lots with homes close to the highway. The backs of these lots generally are undeveloped.

Due north of the site, adjoining the University's present land holdings, is undeveloped property of the United States Forest Service. The Forest Service has contemplated locating a research facility somewhere near the UAJ Campus and this land would appear to be a very attractive site for this use; however, plans for the Forest Service development are still in the formative stages.

Existing Zoning

The existing Auke Lake Campus is in an R12 Residential District zone.

The primary purpose of the R12 zone is to provide and preserve land for families who desire to live in low-density areas where smaller lots would tend to be detrimental to the area. The Juneau Zoning Ordinance specifically permits "Schools; public, parochial and private; including colleges and universities."

Other existing zones in the area immediately surrounding the Auke Lake site, shown in Figure 12, include:

R-M: Multiple Family Residential – Garden Apartments

The purpose of this zone is to provide the opportunity for the establishment of multi-family uses in the lower density ranges, such as townhouses or two-story apartments, particularly where higher density developments would tend to be out of character with that of the existing or prospective development of the adjoining properties.

R-40: Residential–Reserve District

One purpose of the R-40 district is to provide and protect land for families who want to live in a low-density, rural environment where development on smaller lots would tend to be detrimental to the area. Also, it is recognized that much of the rural area of the City and Borough has no pattern or trend of development established. Therefore, this district also may be utilized as a reserve or holding zone from which changes may be made as the community grows, or as needs for various types of land are determined.

CWR: Residential-Waterfront Commercial District

This district is primarily for waterfront apartments and service/commercial uses oriented to the marine element of the community, and is designed to be located close to residential districts. This zoning allows a conditional use of marine-related experimental or research facilities.

C-3: General Commercial

This district is meant to provide areas for those types of retail, wholesale, transportation and service facilities which tend to conflict with the uses permitted in neighborhood and central commercial districts.

UTILITIES

Existing electrical, telephone, sewer and water lines service this site as shown on Figure 13.

Overhead power lines follow the Glacier Highway corridor north of the study area to the south quarter of the site where the lines leave the highway and go straight through the forest to the southeast. The Chapel by the lake is serviced by overhead power. The University's existing power supply is underground from the Chapel's overhead line. The telephone lines servicing this area are all underground.

Sewer collection lines go from a pump station near the existing University buildings along Glacier Highway where the line connects with a wastewater treatment plant on Auke Bay, northwest of the small boat harbor. A 1,200-foot gravity line extends north of the site in the Mendenhall Loop Road where it terminates at the highest point in the road.

The only surface water development in the area is a pipeline which carries lake water from Auke Lake to the Biological Laboratory of the National Marine Fisheries Service. Most of this water is used in the fish hatchery operated by NMFS. The NMFS Lab further treats a small volume of this lake water for domestic use in their building. The University, like all of the residences in the area, now relies upon well water supplies which vary greatly in both quantity and quality.

University buildings are heated with oil-fired systems: two are hot water and one is a forced-air system. Fuel-oil storage tanks are buried between structures and oil is delivered by truck. There is no natural gas distribution system in Juneau. Liquid propane or bottled gas is available but generally is used only where large quantities of fuel are not needed.

SOILS

Some subsurface explorations have been conducted on the Auke Lake Campus site and information on soil types is available from published reports by the Soil Conservation Service. The technology employed by this agency is oriented

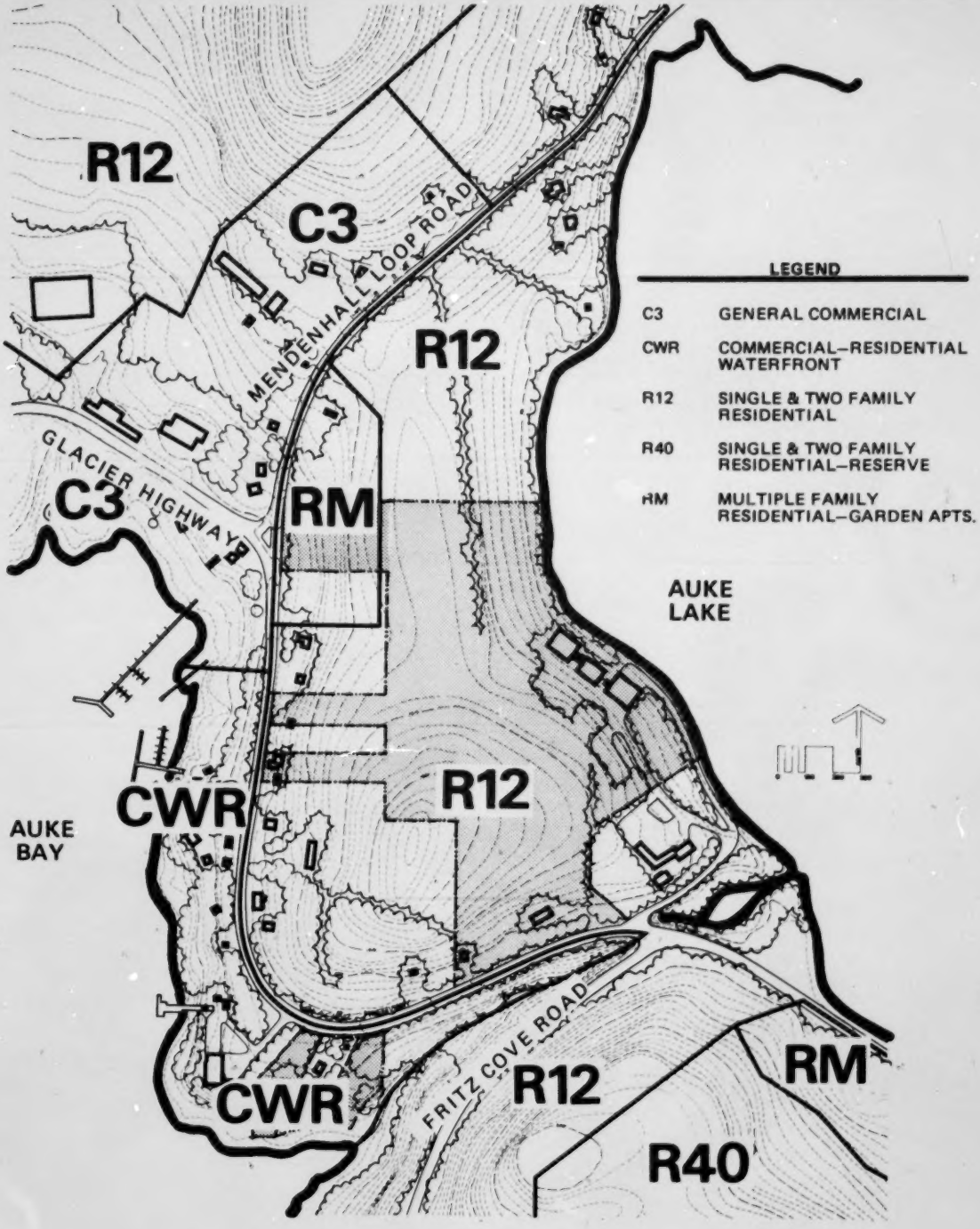

FIGURE 12 – EXISTING ZONING

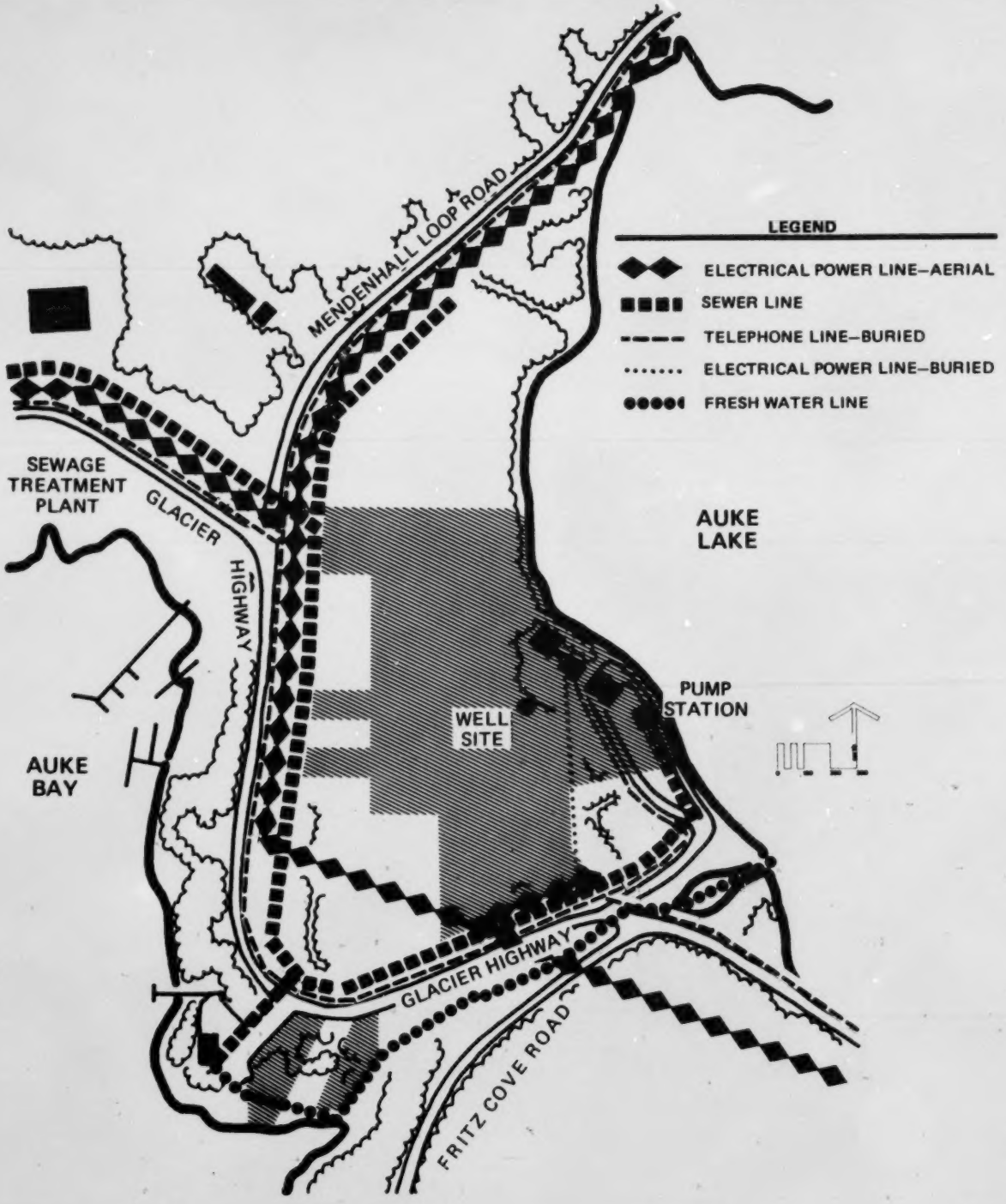

FIGURE 13 – EXISTING UTILITIES

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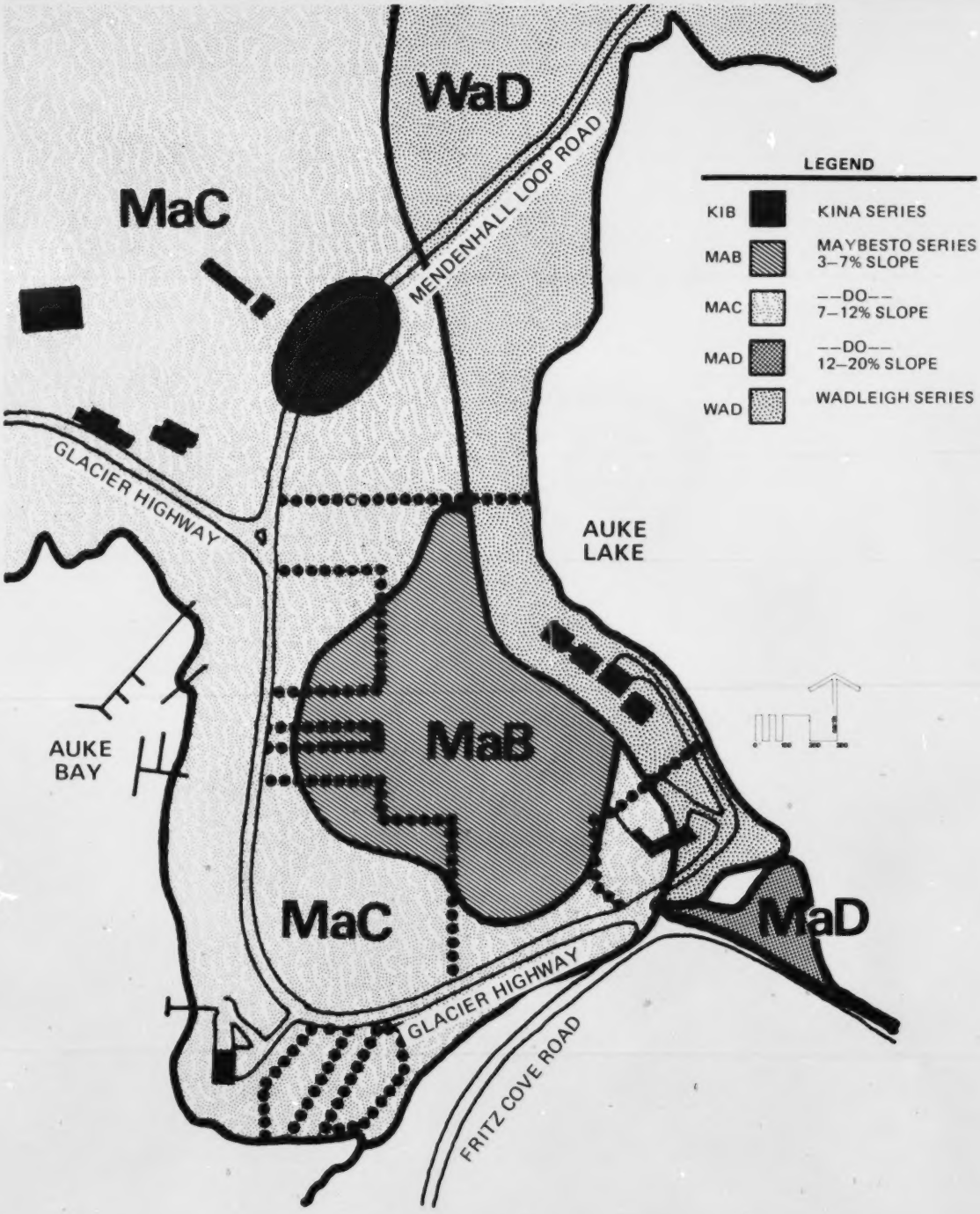


FIGURE 14 – SOIL TYPES

toward agricultural ends, rather than toward construction; however, it is possible to infer probable site conditions, including foundations and soils, from a review of these reports. The basic soil map is shown in Figure 14.

In summary, the area is underlain by a core of bedrock and glacial till, both of which are dense, impervious, stable units, undoubtedly capable of supporting all proposed structures. The upland is overlain in its gentler slopes by a unit of soft peat which ranges from a feather edge in the higher elevations to as much as 6 feet or more in depth. The steeper upland slopes are mantled with slopewash derived from the underlying glacial till. All soils are of relatively low permeability, and yield water slowly, if at all, when once saturated. Groundwater which is probably perched is found at shallow depth beneath the surface thoughout the area.

From our review of the site and the available soil information, the following general conclusions can be drawn:

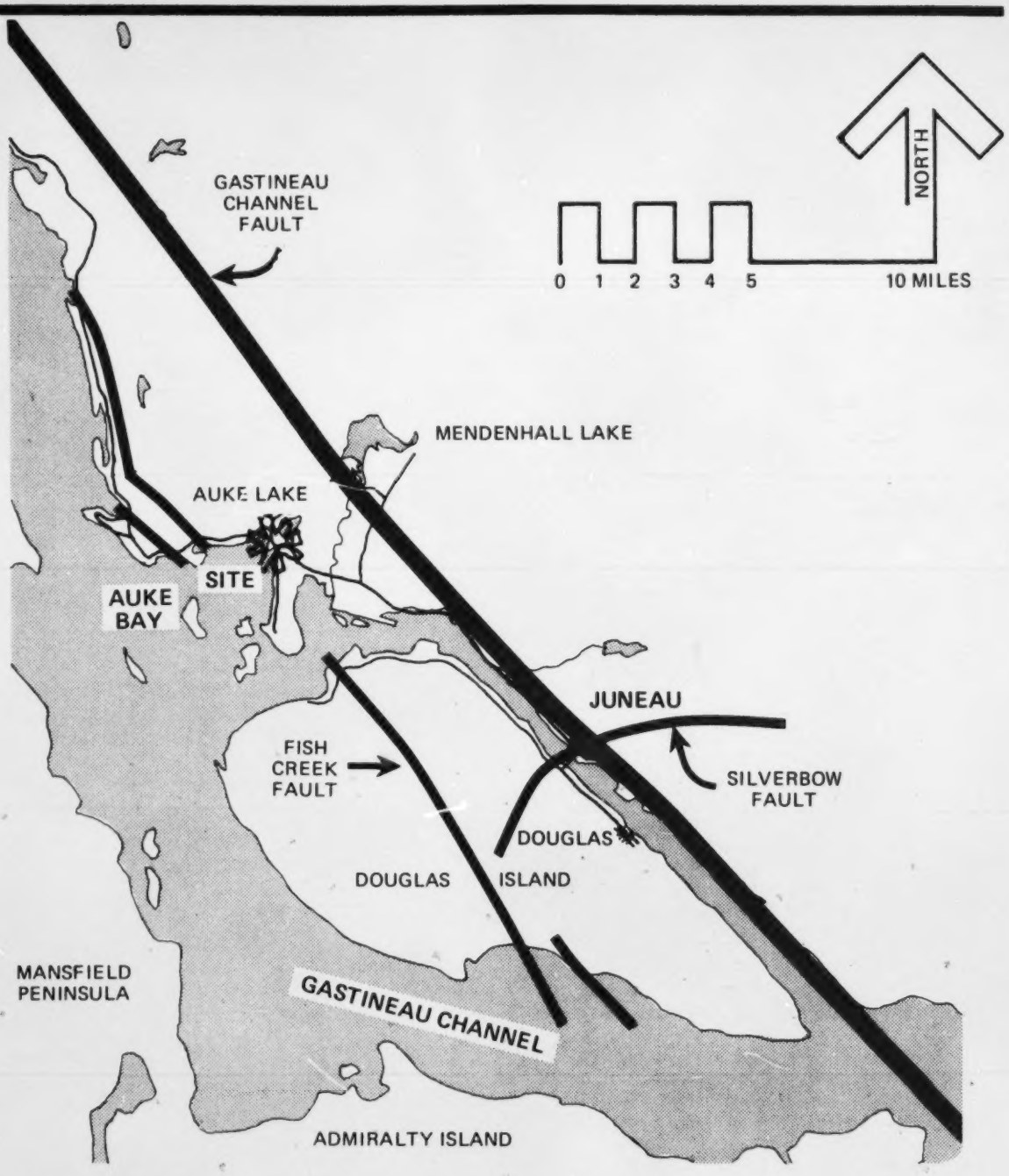
1. Adequate support for the proposed buildings can be found at relatively shallow depth (i.e., 3 to 10 feet) beneath existing grade. Assuming that weather conditions and/or foundation preparation methods are favorable, bearing pressures as high as 8,000 psf may be used for structures founded on the undisturbed glacial till.
2. The upper organic units of the Kina and Maybesto Series should not be used for support of major structures, nor, indeed for anything but the lightest and most flexible of improvements. Parking lots surfaced with flexible pavement may be constructed over these soils if sufficient slope is provided to offset sags or "bird baths" which may develop from differential settlement. Surcharging also can be employed to improve the soft soils *in situ*, thereby minimizing the amount of post-construction settlement. While surcharging could be of considerable help in allowing pavements, walkways, etc., to be supported by the organic soil units, it should not be relied upon for support of important structures such as buildings retaining walls, heavy stairways, etc.
3. Fills to be constructed during the site preparation phase of the project would probably be of two types: 1) disposal areas for stripped organic soils, and 2) semi-structural fills for roadways, parking lots and other grade changes. We consider it unlikely that the organic soils could be employed directly to provide useful embankments. Moreover, they could never be compacted by ordinary earthwork methods. Spoil areas containing organic materials could, in time, be surcharged and ultimately converted into parking lots, athletic areas, etc. Semi-structural fills may be made from the inorganic slopewash units found in the steeper portions of the uplands. With reasonable care and favorable weather, these could be used to construct fills for the support of appurtenances such as driveways, stairways, out-buildings, etc. Under ideal conditions, they could even be used for support of major structures; we suggest, however, that no reliance be placed on this possibility during the planning. Structural fills should be constructed with free-draining granular material (i.e., sand, sandy gravel, or gravelly sand) placed in controlled lifts and thoroughly compacted. Present information suggests that material for structural fills must be imported to the site.
4. Highly organic soils of the type found here are commonly exploited as the principal constituent of commercial topsoil. We therefore believe that the required quantities of topsoil can be obtained by suitable processing of material stripped from construction areas. This operation would include addition of inorganic ingredients and the necessary chemicals to control pH.
5. Detailed soil and foundation conditions for proposed structures should be ascertained by subsurface exploration prior to design.

SEISMIC CONDITIONS

Because of its location in a region with an active earthquake history, Southeastern Alaska is rated as Zone 3 which is the same as California, Nevada and Puget Sound. Earthquakes could occur at any time from shifting along known faults or from faults which are entirely concealed. Known faults near the campus area are shown in Figure 15.

Soil or rock units on which major structures would be supported are not vulnerable to densification nor liquefaction. Landslide hazard from ground shaking is probably not great depending upon individual circumstances, but should be reviewed throughout the design process.

Earthquake engineering is a subject which occupies the attention of an increasing number of investigators, whose goal is to predict frequency, location, magnitude and intensity of earthquakes.



FROM: "GEOPHYSICAL HAZARDS INVESTIGATION FOR THE CITY AND BOROUGH OF JUNEAU, SUMMARY REPORT," OCTOBER 1972, DANIEL, MANN, JOHNSON & MENDENHALL, PORTLAND, OREGON.

FIGURE 15 – GEOLOGICAL FAULTS

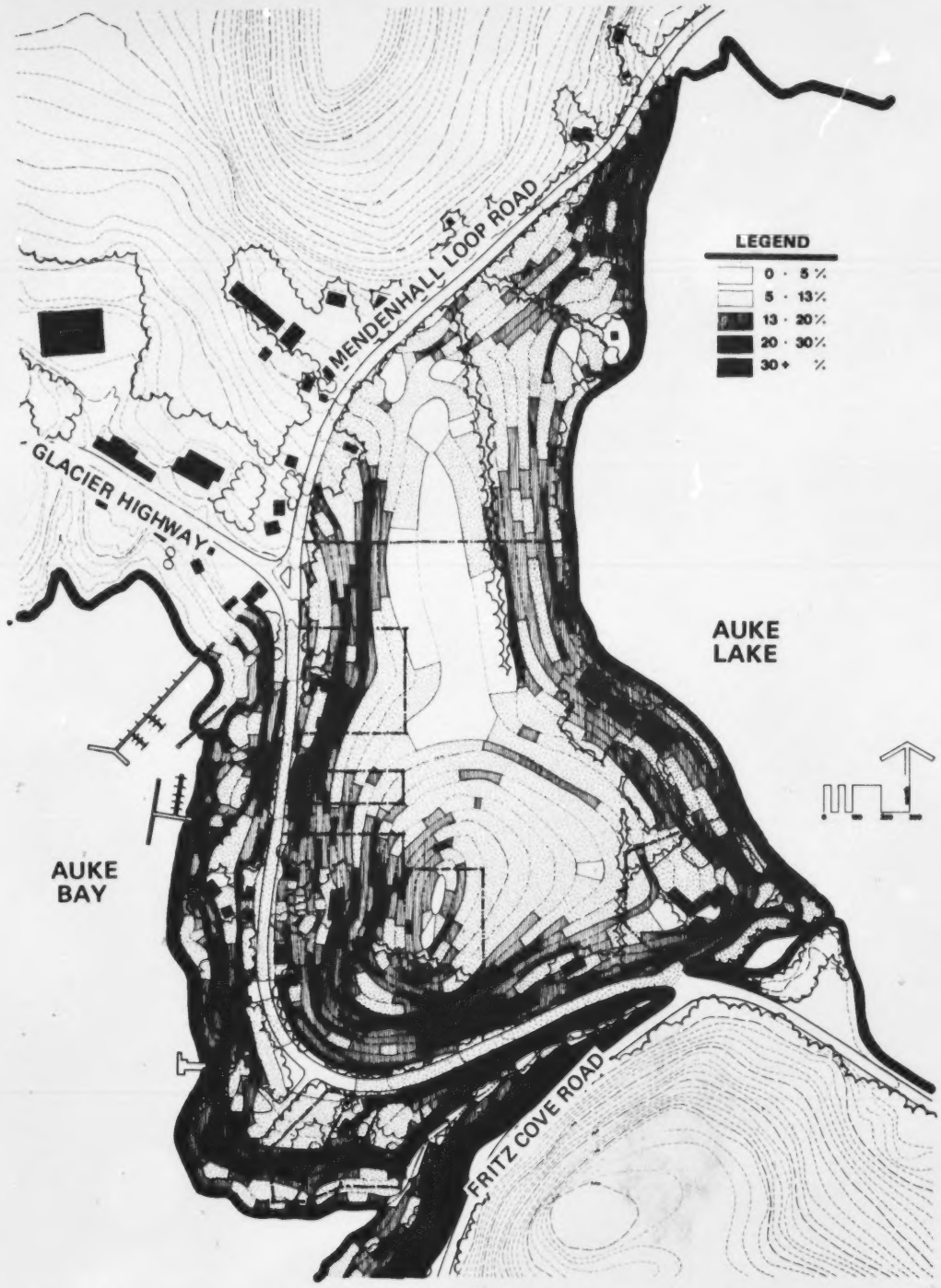


FIGURE 16 – SLOPE DISTRIBUTION

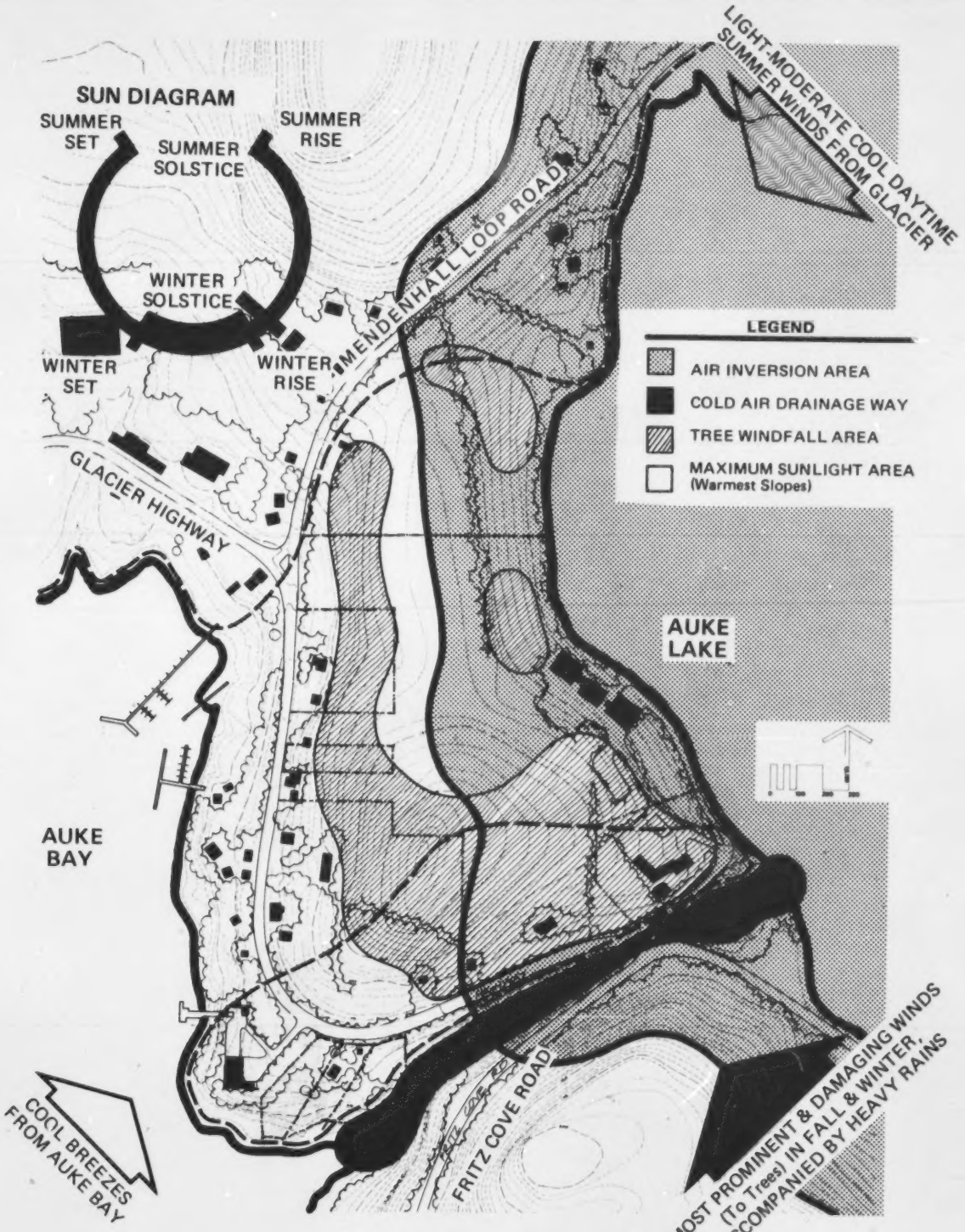


FIGURE 17 – MICROCLIMATE

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The input of information has consisted of: 1) earthquake history of the area which is usually limited to observed effects on people, buildings, and 2) known fault systems in the earth's crust believed to be capable of intermittent movement. The theories which have been developed for frequency of earthquakes of given magnitude or intensity, energy release and acceleration are based mainly upon earthquake history, rather than on knowledge of the major tectonic systems which produce the build-up of stresses and movement. The most glaring weakness of these theories is that the "earthquake history" consists of only a few years.

It should be pointed out that while the major efforts in earthquake engineering appear to have been directed toward earthquakes as such, no record exists anywhere to our knowledge of a wholesomely conceived, well-designed, competently constructed building being overwhelmed or even seriously damaged by ground-shaking in a major earthquake. Some well-designed and constructed buildings have been undermined by earthquake-induced slides, and by foundation failures from liquefaction or densification; these are not to be considered as building failures. In all of the major earthquakes in which modern-type buildings have been damaged seriously, the design has been observed to be unwholesome, and/or the construction has been deficient in technique and quality.

We believe that structures at this site can be rendered reasonably free from serious earthquake damage by attention to the following points:

1. Support of all foundation elements on dense, glacial till or bedrock.
2. A structural design which will distribute seismic stresses uniformly throughout the structure and thus avoid concentrations of seismic loads on structural elements within any localized portion of the building.
3. Control of exterior contours to minimize slope failure.
4. Careful attention during construction to insure that all materials are properly constituted and placed.

SLOPE DISTRIBUTION

The "Slope Distribution" shown in Figure 16 is broken down into five separate ranges.

1. The 0 to 5 percent range is the desirable range for building flat parking lots.
2. The 5 to 13 percent slopes are most desirable for road construction with 13 percent being the maximum slope for building a road in snow country.
3. A slope of 20 percent represents a maximum point for the most desirable building slope.
4. Twenty to thirty percent represents slopes that are buildable, but at a greater expense.
5. *Over 30 percent* slopes are considered unbuildable.

The hilltop in the southcentral portion of the site is the highest vantage point on the site (see Figure 16). Much of the site is too steep for construction. The only area of 0 to 5 percent slope lies due north of the hilltop; this area can be used for large, open parking areas or an athletic field. The most desirable areas for buildings are east, northeast and north of the hilltop. Moderately desirable areas for buildings are southeast, southwest and northwest of the hill. The least desirable areas for buildings are due west and south of the knoll and along the west side of the ridge.

MICROCLIMATE

The main climate considerations of the site are shown in Figure 17.

The microclimate is affected by the sun orientation which causes warm and cold slopes, the cold-air drainage way along Auke Creek and the different winds. The winds from the northeast are cool, moderate daytime breezes while the southwest winds are cool breezes off Auke Bay. The winds from the southeast are strong and cause considerable damage because they occur most often in fall and winter, accompanied by seasonal rains. The rain-soaked soils weaken the holding power of tree roots and the trees are uprooted by the heavy winds.

The shaded areas of the Microclimate Map show past windfall damage. When clearing and developing in these areas, care must be taken to select wind-firm trees; and decisions to thin trees or clear land within these areas must be based upon the stand characteristics, degree of exposure to southeast winds, soil types and building heights.

On those occasional fair-weather days when winds are not sufficient to create turbulence, a cool air layer forms in the Auke Lake basin causing an inversion layer. Care must be taken to prevent smoke or stack emissions from being released into this basin area and creating a smog hazard.

FLORA AND FAUNA

A fairly even stand of coniferous timber covers

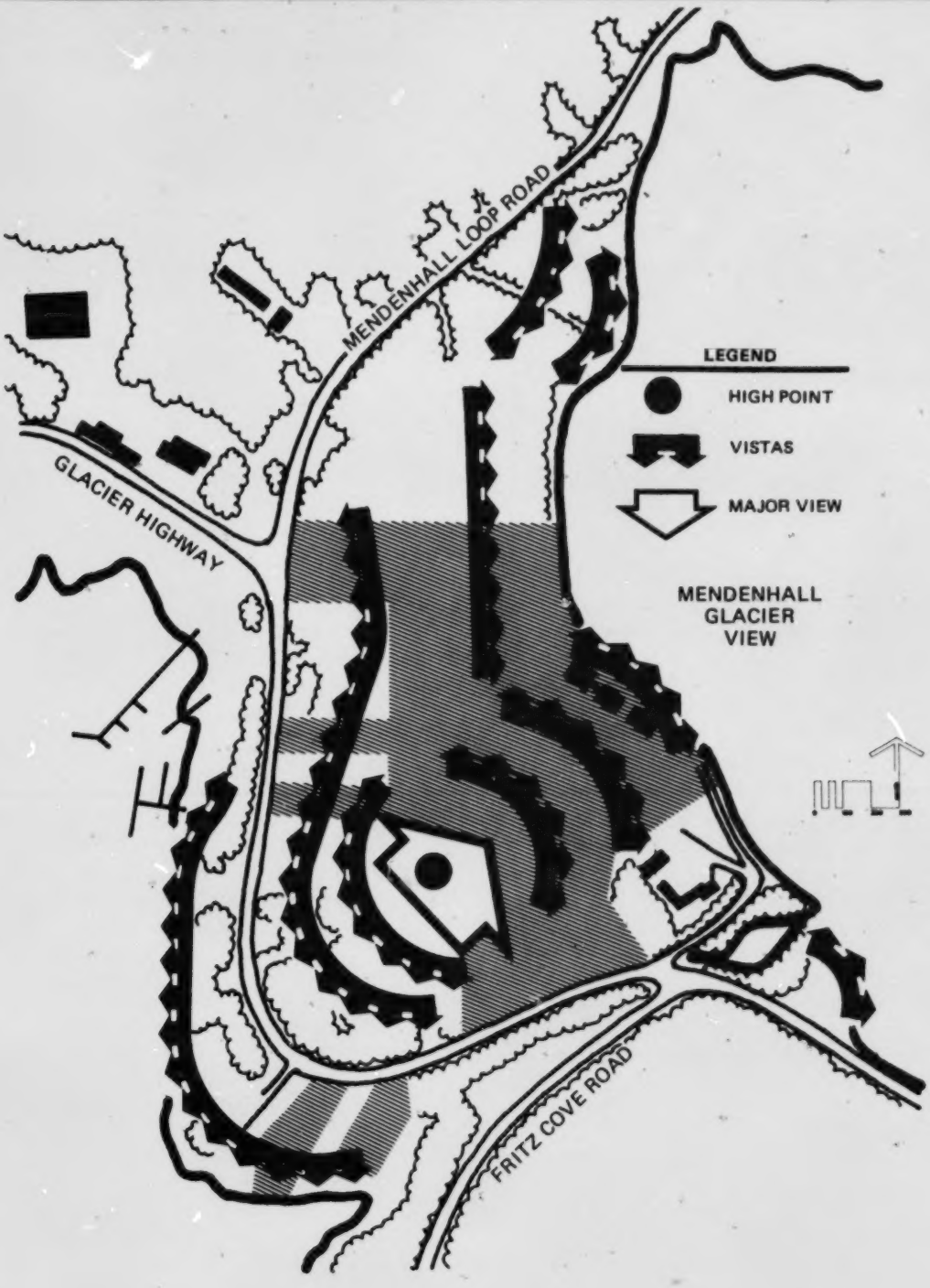


FIGURE 18 – EXISTING NATURAL VISTAS

the site. This stand dates back to an extensive windthrow in the late 1870's. The storm which caused this windthrow struck from the southeast as observed from the large number of decayed, moss-covered logs on the ground. The most common conifer on the better drained sites is Western Hemlock with Sitka Spruce being a frequent associate. Mountain hemlock often is found where drainage is impeded and is the most common tree on the more open, poorly drained, scrub-timber areas.

Shore pine (lodgepole pine) occurs on and along muskegs and scrub areas. A number of specially large and shapely shore pines are located on the muskeg beside the Loop Road.

Hardwood trees are scarce in this area, with scrub Crabapple occasionally occurring in wet areas and in open scrub stands. Red Alder and Sitka Alder also occur commonly in recently cleared areas and in moist muskeg fringes.

Many native shrubs occur in this area. The understory is not plentiful under dense stands of conifer forest but becomes vigorous where stands are open and light is available. Early Blueberry, Alaska Blueberry and Red Huckleberry are common shrubs in the more open scrub stands. Rusty Menziesia is a common shrub in open forested areas. Canadian Dogwood is a frequent groundcover in shaded areas. In wet areas, Devils-club and Skunk Cabbage are abundant.

The site has a fairly large population of wildlife. Land mammals which have been observed on the site include bear, deer and rodents. The marine mammals in Auke Bay include the Harbor Seal, Harbor Porpoise, Pilot Whale, Killer Whale, Humpback Whale and the California Grey Whale. Fishes in the Auke Creek and lake system include Dolly Varden and Cutthroat Trout, and Sockeye, Coho, Pink and Chum Salmon; Stickleback and Cottid. Many birds also are abundant in the area, including Ravens, Fish Crows, Eagles, Gulls, Loons, Guillemots, Auklets, Murrelets, Scaups, Scoters, Grebes, Terns and many other waterfowl.

VISUAL ANALYSIS

The Auke Lake Campus site is one of the most visually exciting locations imaginable for a university. Spectacular vistas over Auke Lake and Auke Bay are available on most of the site.

From many points on the site, you can see the Mendenhall Glacier and the mountains beyond. Long, corridor views can be seen from Glacier Highway and quick views are often caught through the trees. See Figure 18.

The terrain is especially interesting. Most of the steep slopes are on the south and west sides of the hill and along the western side of the ridge towards Auke Bay. The hills to the north and south of the study area are steeper than the campus site, and provide a mountainous backdrop. The Auke Creek bed lies in a deep ravine which forms a tightly enclosed space. See Figure 19.

Most of the open drainage ways on the site lead into the Auke Lake basin along swales or open marshes. The wet bog areas shown on the map appear to be marshy throughout the year.

The condition of the lake shoreline is an important factor in the recreational development of the lake. The shoreline consists of three conditions: 1) areas where bedrock or hardpan appears at the waterline, 2) gravelly or broken slate beaches, and 3) areas of fine silts or sand. The rock areas can be developed with the least amount of damage to the shoreline, and the silt areas are the most sensitive. These silt or sand areas of the shoreline support much vegetation, are shallow and mucky, and are valuable feeding areas for fish and waterfowl.

ANALYSIS COMPOSITE

Figure 20 represents the summary of all information presented in this section under "Existing Conditions."

The drawing is meant to set guidelines for the development of the study area and it is not meant to set hard and fast rules of where to build and not to build. More detailed soils, topography, vegetation and other information must be surveyed before locating specific building locations.

In order to develop this drawing, information data was given three priorities:

1. Most important considerations:
   - Slopes
   - Soils-geology
   - Seismic
2. Moderately important considerations:
   - Microclimate
   - Flora-fauna
   - Visual analysis
3. Other considerations:
   - Utilities
   - Zoning
   - Land use

Using these criteria, the site was divided into four classifications. **Classification "A"** is the area of most desirable characteristics on the site. It is very flat, well-drained, has a relatively good geologic sub-base, little earthquake problem, and a good microclimate situation. **Classification "B"** includes the area which is most usable for building and has

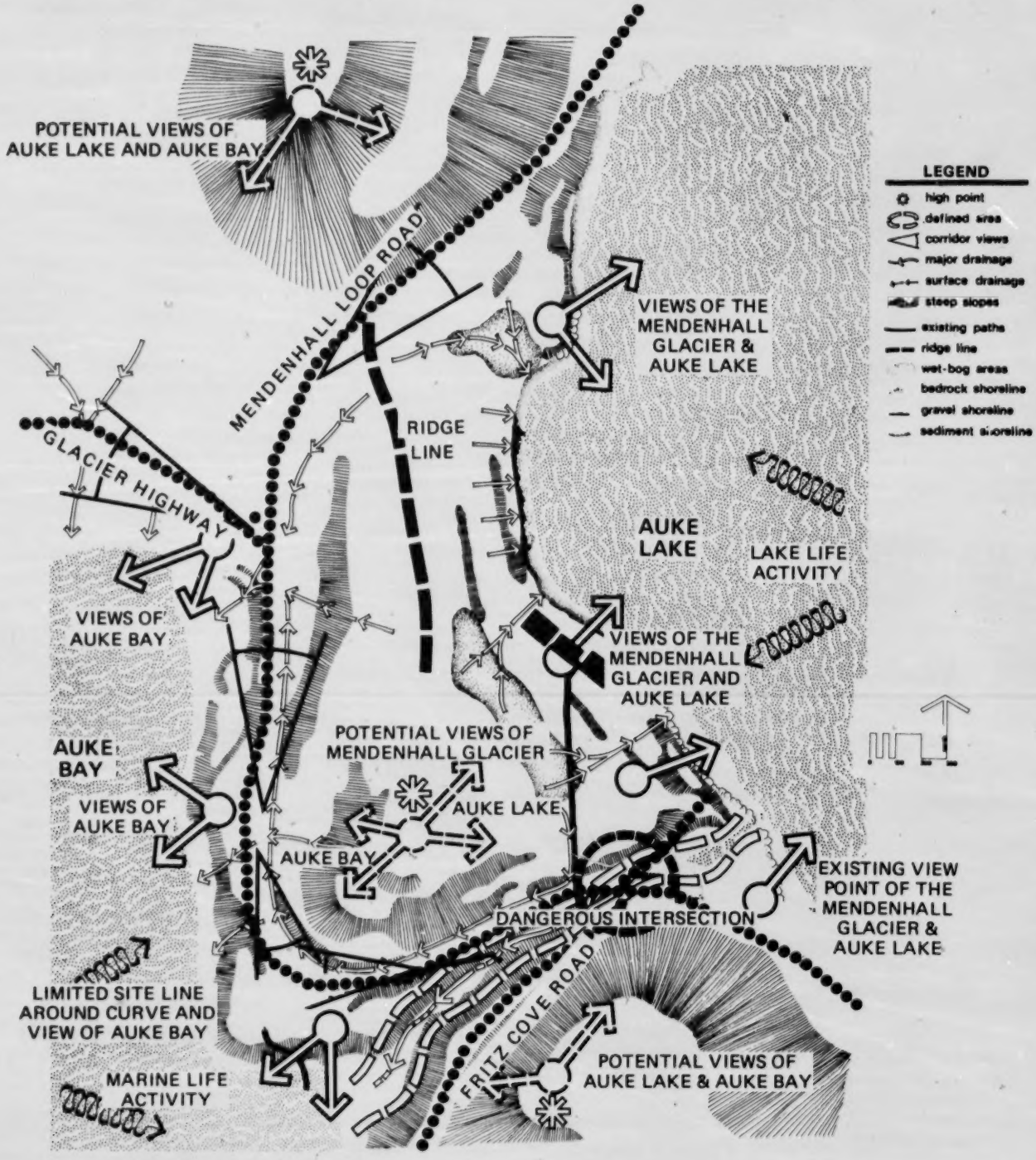


FIGURE 19 – VISUAL ANALYSIS

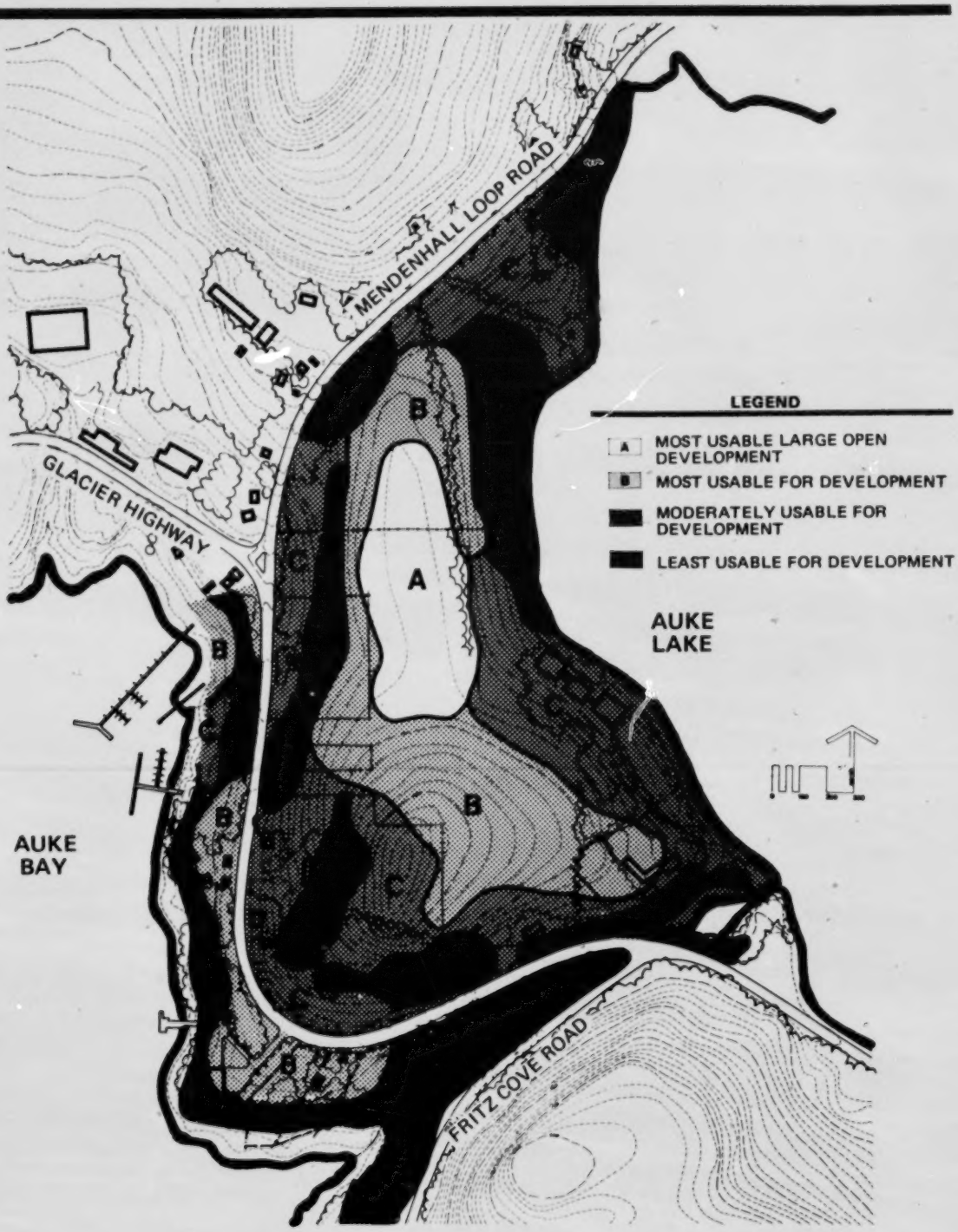


FIGURE 20 – ANALYSIS COMPOSITE

the following characteristics:

- Good slope range from 5 to 13 percent.
- Soils with bedrock or stable till sub-base.
- Relatively good drainage.
- Little to no earthquake problems.
- Good views.
- Good microclimate situations.

Classification "C" includes the areas which are moderately usable for development. This area has the following characteristics:

- Fair slope range from 13 to 20 percent.
- Fair soils and sub-base.
- Moderate drainage problems.
- Little earthquake problems.
- Views if possible.
- Some microclimate problems allowed.

Classification "D" is the area least suitable for development and should be avoided wherever possible. The characteristics of this area are:

- Poor slope range from 20 to 30 percent, or more.
- Fair to poor soils and structural conditions.
- Damage problems.
- Earthquake problems.
- Little or no views.
- Microclimate problems.

Again, these classifications are meant only as guidelines and serve only as a tool in planning general development of the study area.

4. The Question of Size

In the previous section, the existing physical qualities of the Auke Lake site were analyzed in detail. In this section, the question "What should we fit on the site?" will be addressed.

GROWTH IN ALASKA AND THE SOUTHEAST

Figure 21 and 22 show population projections for the State of Alaska as given by the *Alaska Statistical Review*, Department of Economic Development and the *Academic Development Plan for the University of Alaska.*

These curves trace the growth in Alaska's population from 1930 to 1975. Depending upon how one analyzes the curve from 1975 onward, it appears that the population of Alaska will be somewhere around 500,000 by the year 1985. Also shown is a similar projection for population in only the Southeastern Region of Alaska. By interpreting this curve, it appears that the population of the Southeastern Region will be somewhere around 67,000 by the year 1985. Both curves rise on the same slope, which leads to the conclusion that the population growth in both the State and the Southeastern Region will continue to advance at the same rate as in the past ten years.

What impact moving the State Capitol out of Juneau might have upon population curves projected for the Southeastern Region is difficult to assess. Such a move could cause a loss of population in the Juneau area, resulting in a decline in the number of potential students, particularly those in two-year programs such as business skills. On the other hand, the University's position as a local employer could be enhanced.

The *Academic Development Plan for the University of Alaska* recommends that the University establish 6 percent of the State's population as an enrollment goal for the next five years (p. 63). We assume that this "enrollment goal" is a "headcount enrollment" or the unduplicated number of students that enroll for courses. A state-by-state comparison of higher education statistics for the fall of 1971 summarized by George H. Wade (quoted p. 59, *Academic Development Plan for the University of Alaska*) indicated higher education total enrollments in Washington/Oregon/Idaho averaged 5.3 percent of those States' populations; while in 1971, enrollment in Alaska amounted to 3.9 percent of the population. With this in mind, the 6-percent goal for Alaskan enrollment over the next five years seems reasonable.

Calculating 6 percent of the projected population for the Southeastern Region, as represented in Figure 22, it is possible that the post-secondary headcount enrollment in the Southeastern Region could reach 3,600 students by the year 1985. Figure 23 examines enrollment statistics for the Southeastern Region in greater detail.

In 1975, based upon the Southeastern Region population of about 48,000, the 6-percent goal for student enrollments was approximately 2,880. With a total enrollment of 2,382 students in the fall of 1975, including the enrollment at Sheldon-Jackson Junior College, this goal had been nearly reached. If only State schools are included in the percentage, only about 4 percent of the population

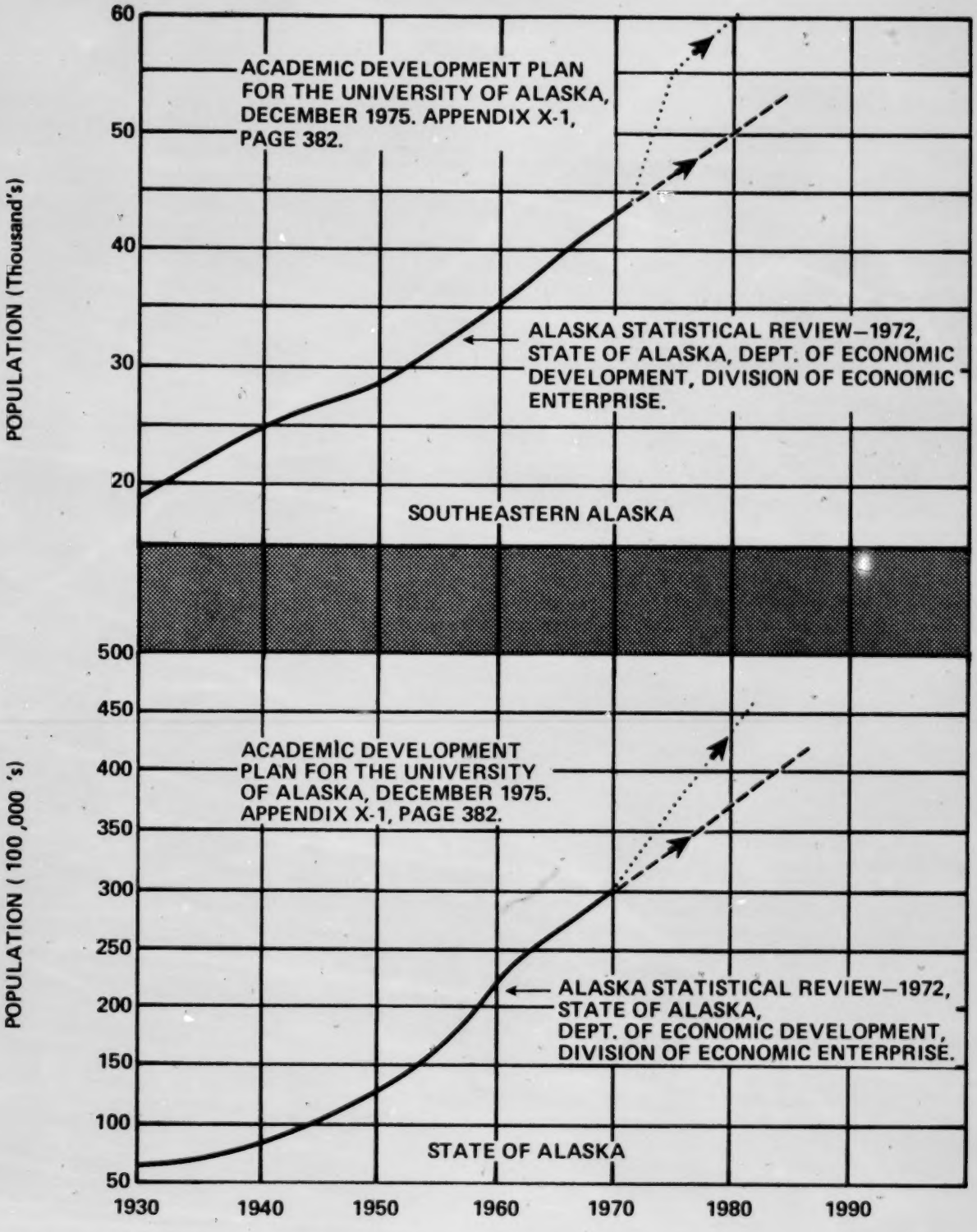


FIGURE 21 & 22 – POPULATION PROJECTIONS
STATE OF ALASKA/SOUTHEASTERN ALASKA

	FALL SEMESTER								
	1960	1965	1970	1971	1972	1973	1974	1975	Spring 1976
UAJ – Senior College	–	–	117	172	212	479	477	410	1054
Juneau–Douglas Community College	186	131	126	203	218	311	534	655	953
SUB-TOTAL	186	131	243	375	430	790	1011	1065	2007
Ketchican Community College	98	91	120	133	151	154	342	509	726
Sitka Community College	–	17	42	69	72	97	282	397	468
Sheldon–Jackson College, Sitka	96	144	195	213	254	324	369	411	383
SUB-TOTAL	194	252	357	415	477	575	993	1317	1577
TOTAL	380	383	600	790	907	1365	2004	2382	3584
Ratio – Senior College/ Community or Junior College	–	–	1:4	1:3.5	1:36	1:2	1:3	1:5	1:25

NOTE: Head count or unduplicated number of students who enroll for courses.

FIGURE 23 – ENROLLMENT IN SOUTHEASTERN ALASKA

was attending secondary educational institutions.

Enrollment statistics in Figure 23 have been broken down between the UAJ Senior College and the Douglas Community College, both of which are on the University of Alaska, Juneau Campus. A sharp increase in enrollment in the UAJ–Senior College is seen for 1976. This increase is contrary to the typical trend, in that spring enrollments are usually slightly lower than fall semester enrollments. The increase can be attributed to the new UAJ Fisheries Program and additional teacher-education programs. The effect this rise has on the ratio of senior to community and junior college students is also shown. This ratio varies from 1:2 to 1:5, depending upon the year. In other states, this ratio also varies depending upon time and locale; but in Washington, for example, the ratio is close to 1:1. It is assumed, therefore, that as the senior college grows, the number of senior college students will reach parity with the number of community college students.

From the population curves for the State and Southeastern Region, and by examination of present enrollment trends, if growth proceeds at approximately projected rates, planning for the Auke Lake Campus may utilize the following rough enrollment projections:

	1975	1980	1985	1990
UAJ Senior College	400	1,000	1,500	2,100
Juneau-Douglas Community College	600	1,200	1,500	2,100
TOTAL	1,000	2,200	3,000	4,200

A very serious caution must be expressed here: these enrollment projections are, at best, a very rough guess. According to the enrollment for the UAJ Senior College in the spring of 1975, the college has already exceeded the above 1980 projection! The *Higher Education Facilities Planning Study of the University of Alaska Southeastern Region* studied the potential employment market, rather than population trends, and arrived at a potential student enrollment in the region by 1980 of 6,237 students or well over twice what population trends indicate. This is not to say that either projection is "right" or accurate," only that they are different, and this difference indicates the level of accuracy which must be attributed to *any* enrollment projection. All enrollment projections should therefore be viewed with critical caution.

The value in enrollment projections is not in trying to tie the development of the physical plant to a relatively aribitary enrollment figure; the value is in recognizing trends and trying to predict the direction of growth. Clearly, Alaska in general and the Southeastern Region in particular are experiencing an unprecedented growth-trend towards post-secondary education. Colleges are faced with the double burden of a rapidly expanding population and the need to expand educational opportunities to include a larger percentage of the population. While the size and rate of this growth may be a matter of question, there is no doubt that the student need will be present in the Southeastern Region for quite some time.

Furthermore, two other trends can be identified: 1) a definite increase in senior college enrollments as the ratio of senior to community college students reaches 1:1; and 2) a further increase in students from outside the Southeastern Region and outside Alaska, as specialized graduate programs like the Division of Fisheries attract a wider student enrollment.

While the trend is definitely towards an increased educational demand, the only inaccuracy is in predicting the rate of this demand. Since this rate of growth is most difficult to assess, this report drops any further reference to particular dates. We would like to think of the development discussed here as occurring on an elastic time scale. In short, we know that the Auke Lake Campus will grow, but we have no clear picture of how fast the campus will grow. Since this Site Development Study looks at the overall development of the Auke Lake study area, it really doesn't matter if this development occurs in 1980, 1990, the year 2000, or beyond.

According to the *Academic Development Plan for the University of Alaska*, the financial resources will exist to meet this demand for educational services, but only if the State's resources are committed to improving the State's educational system. There is little doubt that the talent and initiative exist in the Southeastern Region to implement the growth of the educational program on the scale predicted if funds should become available.

ESTABLISHMENT OF PLANNING RATIOS

In order to set up the basic physical planning parameters for the Auke Lake site, basic planning data was requested from four colleges in and around Seattle, Washington, with an approximate student FTE* enrollment of 4,000 students. This information is listed in Figure 24. Mean averages for acreage of the site, assignable square feet within the buildings, parking spaces available and student FTE enrollment are shown. From this basic data, ratios were established for assignable square feet per acre, FTE student enrollment per acre, parking per FTE student and assignable square feet per FTE student. These numbers become rule-of-thumb guidelines for future planning and are indicated in the shaded portion of Figure 24. The decrease in the parking ratio will be mentioned later in this report. An important ratio is the gross square feet per FTE of 125. This is the general planning guideline upon which many of the development decisions for the Auke Lake Campus will be predicated. This planning ratio is sometimes expressed as a ratio of assignable square footage per FTE, or "student enrollment." The University of Washington's planning guidelines, for example, use "assignable square feet per student." The number ranges from a low of 90 square feet for a liberal arts student to a high of 500 and even 750 square feet for medical students and other health

*FTE = full time equivalent student enrollment.
FTE is the traditional measure of an institution's service load. One FTE is defined as:
Juneau-Douglas Community College – 15 semester hours.
University of Alaska, Juneau Senior College – 12 semester hours.
FTE Enrollment reduces all full-time and part-time students to a common denominator

	Bellevue C.C. Bellevue, WA.	Clark College Vancouver, WA.	Highline College Seattle, WA.	Shoreline C.C. Seattle, WA.	Mean	Recommended Planning Ratios
Acres	97	90	80	83+	87.5	
Assignable Sq. Ft.	289,000	340,000	263,000	350,000	310,000	
Parking Spaces	2,155	1,500	–	2,000	1,885	
Students F.T.E.	3,600	4,000	4,400	4,600	4,150	
Assignable Sq. Ft./Acre	2,900	3,800	3,300	4,200	3,550	→ 3,500
F.T.E./Acre	37	44	55	55	48	→ 45
Parking/F.T.E.	.6	.4	–	.4	4.6	→ .2
Assignable Sq. Ft./F.T.E.	80	85	60	80	76	→ 75
Gross Sq. Ft. (65% effective)	475,000	561,000	434,000	577,000	512,000	
Ground Contact (2.5 stories)	190,740	224,000	173,000	231,000	205,000	
Gross Sq. Ft./F.T.E.	131	140	98	125	124	→ 125

FIGURE 24 – PLANNING RATIOS

sciences. The *Higher Educational Facilities Planning Study of the University of Alaska Southeastern Region,* used "150 square feet per FTE student."

Using the ratios shown in Figure 24 and based upon the gross acreage available, assignable square feet, parking spaces and student enrollment projections were made for various phases of the development of the site as shown in Figure 25.

Phasing of development and related size requirements are shown on Figure 26. The three phases now contain 34 acres, accommodating 1,500 FTE students and 300 parking spaces. In the intermediate phase, 2,700 FTE students can be accommodated on 59 acres and would require 540 parking spaces. The final phase, or totally developed campus, contains 69 acres, accommodates 3,200 FTE students and requires 640 parking spaces. These size parameters were used to develop the pattern of growth for this Site Development Plan.

The development of planning parameters was based not only upon other campus ratios, but also upon certain desirable planning objectives which are summarized in Figure 27.

These charts indicate site coverage for three different types of campuses. The pie chart at the top of Figure 27 shows land use on an urban campus, specifically the University of Washington. Of the total land area on the University of Washington campus, approximately 15 percent is occupied by building ground contact and 8 percent by sports facilities. Seven percent is devoted to roads and sidewalks, 30 percent to parking and 40 percent is so-called "open spaces." These ratios may be contrasted to those of a suburban campus in the middle pie chart in Figure 27. As is shown, a suburban campus has approximately one-half the building ground contact area found on an urban campus. Both campuses have approximately the

	Present	Present Phase	Intermediate Phase	Final Phase
Acres	34		34	59	69
Assignable Sq. Ft.	25,000		118,000	206,000	242,000
Parking Spaces	80		300	540	640
Students F.T.E.	400		1,500	2,700	3,200
Assignable Sq. Ft./Acre	735	3,500			
F.T.E./Acre	11.7	45			
Parking/F.T.E.	.2	.2			
Assignable Sq. Ft./F.T.E.	62.5	75			
Gross Sq. Ft. (65% effective)	38,000		196,000	340,000	399,000
Ground Contact (2.5 stories)	19,000		78,400	136,000	160,000
Gross Sq. Ft./F.T.E.	95	125			

Recommended Planning Ratio

NOTE: Education space only, does not include residential space, or athletic facilities in assignable sq. ft.

FIGURE 25 – GROWTH PATTERN

same amount of space devoted to sports activities, circulation and parking; whereas, open space is somewhat higher on a surburban campus.

The UAJ Campus at Auke Lake site presents some special requirements. The lower pie chart in Figure 27 represents the distribution of land on the Auke Lake Campus. Building ground contact area is a little bit higher than it is for a suburban campus. Sports activities have been placed off campus, and are not shown on the Auke Lake Campus site coverage chart. Circulation is approximately the same as it would be for a suburban or urban campus. The area devoted to parking is approximately one-half what it would be for either a surburban or urban campus. Due to the topography and nature of the Auke Lake site, it does not lend itself well to the establishment of large parking areas. Open space on the Auke Lake Campus is approximately 20 percent more that it would be on a suburban campus. However, because of the steep terrain, heavily wood areas and poor soil conditions on the Auke Lake site, approximately 45 percent of the site is considered unsuitable for building. Therefore, while there is a larger proportion of "open space" on the Auke Lake Campus than would be found on either a suburban or urban campus, there is also a larger percentage of unsuitable, unbuildable land

CLASSIFICATION OF SPACES

Having determined how much of the site should be devoted to buildings, open space, parking and

PRESENT PHASE

34 Acres

1,500 F.T.E.

4,500 Headcount

3:1 Ratio

300 Parking Spaces

INTERMEDIATE PHASE

59 Acres

2,700 F.T.E.

6,750 Headcount

2.5:1 Ratio

540 Parking

FINAL PHASE

69 Acres

3,200 F.T.E.

6,400 Headcount

2:1 Ratio

640 Parking

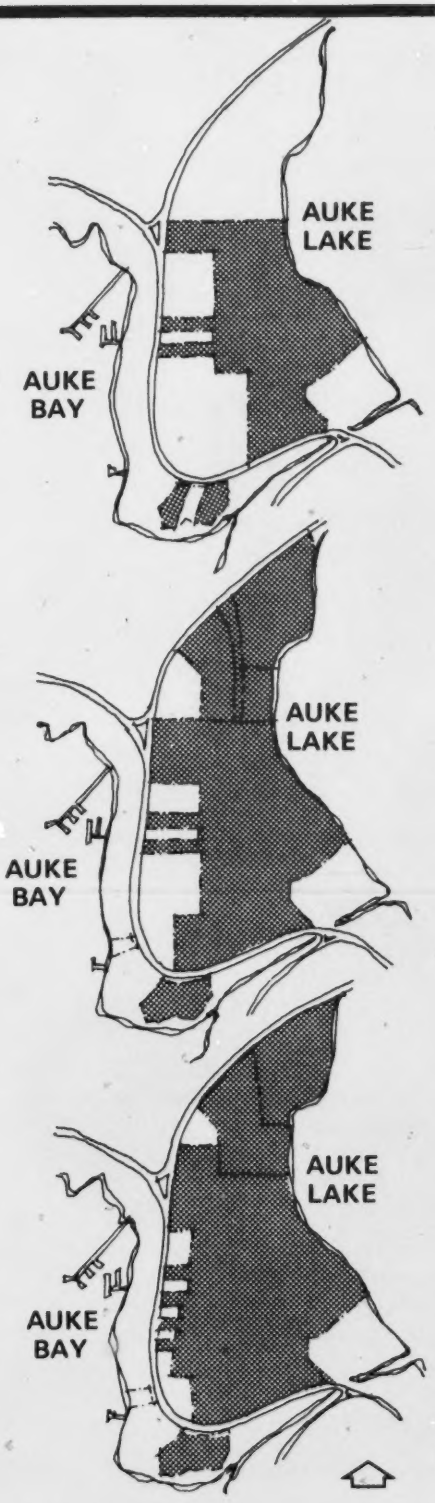


FIGURE 26 – DEVELOPMENT PHASING

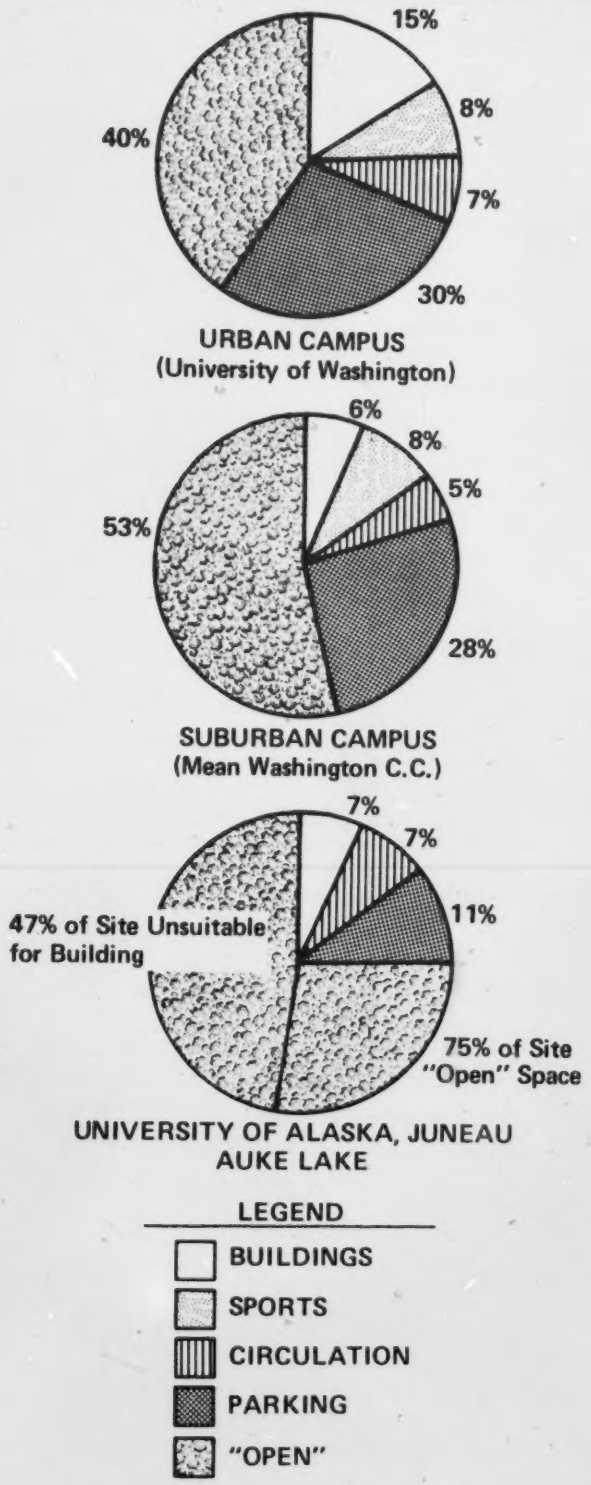


FIGURE 27 – SITE COVERAGE

circulation, the 7 percent of the site which will be devoted to building ground contact area can be examined in greater detail. Figure 28 is a reproduction of a page from the University of Alaska's Master Design Manual which shows generic space classification indexes for the buildings on a typical campus. On the right of this chart, the breakdown of these spaces at the University of Washington is shown. Further to the right is a breakdown of the same generic space classification for the University of Alaska, Auke Lake Campus. This information is summarized in Figure 29.

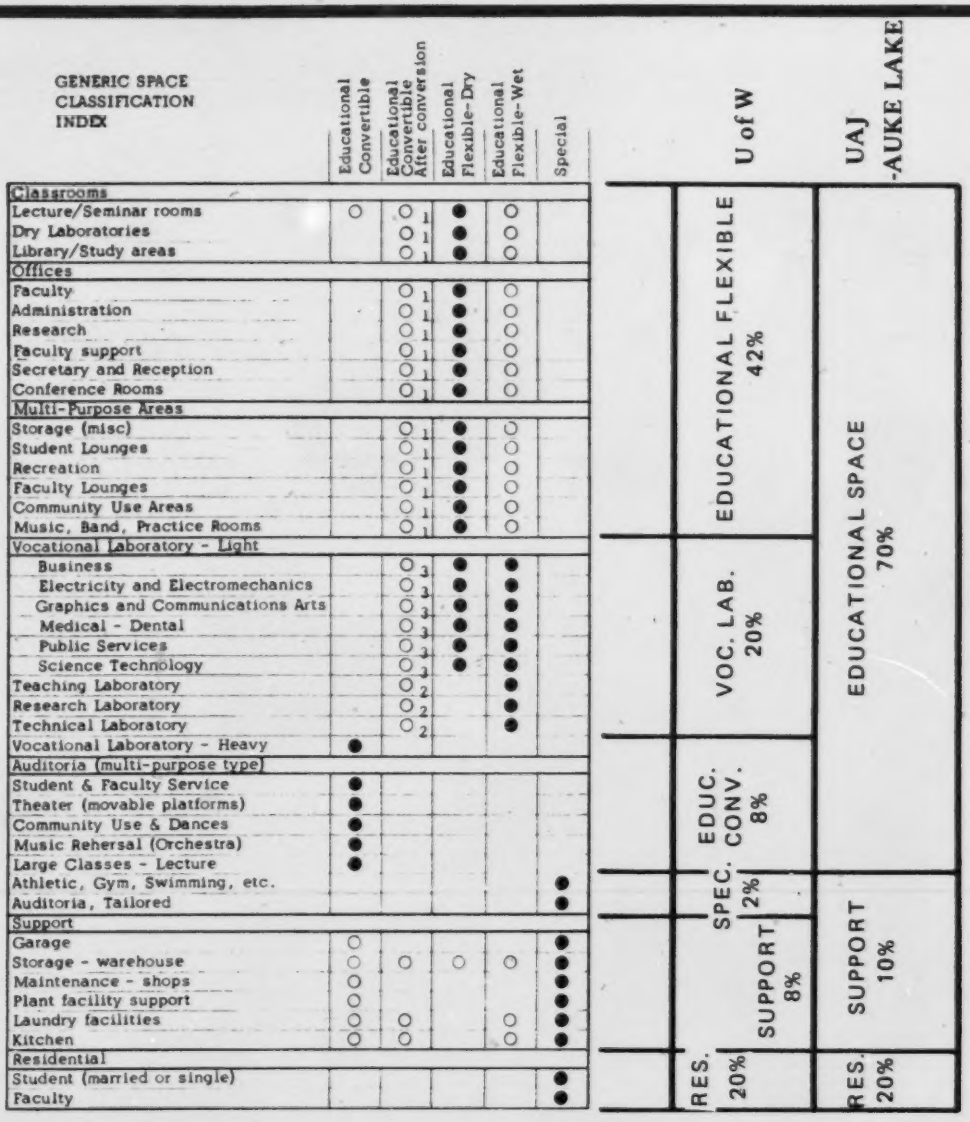
Approximately 70 percent of the buildings on the Auke Lake Campus will be devoted to educational space. This educational space will be broken down further into educational flexible, 42 percent; education convertible, 8 percent; and vocational labs, 20 percent. Approximately 20 percent of buildings on the Auke Lake Campus will be residential. This is a higher ratio than is typically found on a university campus, but supports the University's objective of providing a larger amount of housing than normally is found on a traditional campus. Approximately 10 percent of the space on the Auke Lake Campus will be devoted to support activities. This compares with approximately 12 percent on the University of Washington Campus, but assumes that sports facilities will *not* be on the Auke Lake Campus site.

Changes in the growth pattern for the UAJ, Auke Lake Campus are summarized on Figure 30.

Currently, approximately 90 percent of the square footage on the Auke Lake Campus is devoted to educational usage, while 10 percent is used for support activities. As the campus grows towards a student population of approximately 3,200 FTE students, the percentage of floor space devoted to support activities would remain at approximately 10 percent while educational-use square footage would decrease from 90 to 70 percent and residential use would have a corresponding increase, from 0 to 20 percent. These planning ratios are presented as a guideline to how the character of the campus will change from the year 1975 to a total student enrollment of 3,200 students.

CAMPUS SIZE BY SQUARE-FOOT FACTORS

As a double check on the earlier analysis, the question of campus size was approached from a different perspective. Planners have established square foot per FTE ratios for educational space, residential use, parking, circulation and sports. These factors are shown in Figure 31. These ratios,



● First order of use-space intended to be housed with-in the specific generic group indicated.

○ Second order of use-space that can be housed in other than its' own specified generic group.

1. Second order of use-after structural conversion-dry, second floor only.
2. Second order of use-after structural conversion-wet, ground floor only.
3. See Educational Flexible- wet & dry for specific sub-category of Vocational lab., Light.

FIGURE 28 – GENERIC SPACE CLASSIFICATION INDEX

FIGURE 29 – GENERIC SPACE USE CATEGORY

70% EDUCATION SPACE

42% Educational Flexible
- Classrooms
- Seminars/Conferences
- Laboratories
- Multi-purpose
- Lounges

8% Educational Special
- Auditoria – Multi-purpose
- Student/Facility Services
- Music and Lectures

20% Vocational Labs
- Teaching
- Research
- Technical

20% RESIDENTIAL

- Students
- Faculty
- Guests

10% SUPPORT

Special
- Athletic
- Auditoria/Performing Arts

Service
- Heating
- Laundry
- Kitchen
- Maintenance
- Storage

multiplied by the anticipated student load, will give the gross square footage. Assuming different building heights for different uses, the gross ground contact for all buildings on the campus were determined. These ground contact figures were compared in turn to the pie charts on Figure 27. The close parallel in the percentage breakdowns indicates that the site coverage as shown in Figures 27 and 31 are reasonable for planning purposes.

SUMMARY

To approach the question of size of the Auke Lake Campus site, planning ratios were determined from basic data gathered from campuses around Seattle, Washington. These planning figures were then modified because of the unique nature of the Auke Lake site. In general, the State of Alaska and the University of Alaska, Southeast are riding the crest of a wave of increased demand for educational services. It is uncertain how quickly response to this demand can be mobilized, but it is clear that rapid growth is imminent. The Auke Lake Campus now contains 34 acres and could accommodate 1,500 FTE students or about 3.5 times the number presently on the campus. Total development of the study area would involve a parcel of 69 acres which could accommodate 3,200 FTE students. On this site, 7 percent of the land would be devoted to buildings, approximately 70 percent to open space, 11 percent to parking, and 7 percent to circulation. Of the 7 percent devoted to buildings, 70 percent would be educational, 20 percent residential, and 10 percent support. These basic planning size factors will now be applied to the physical site itself.

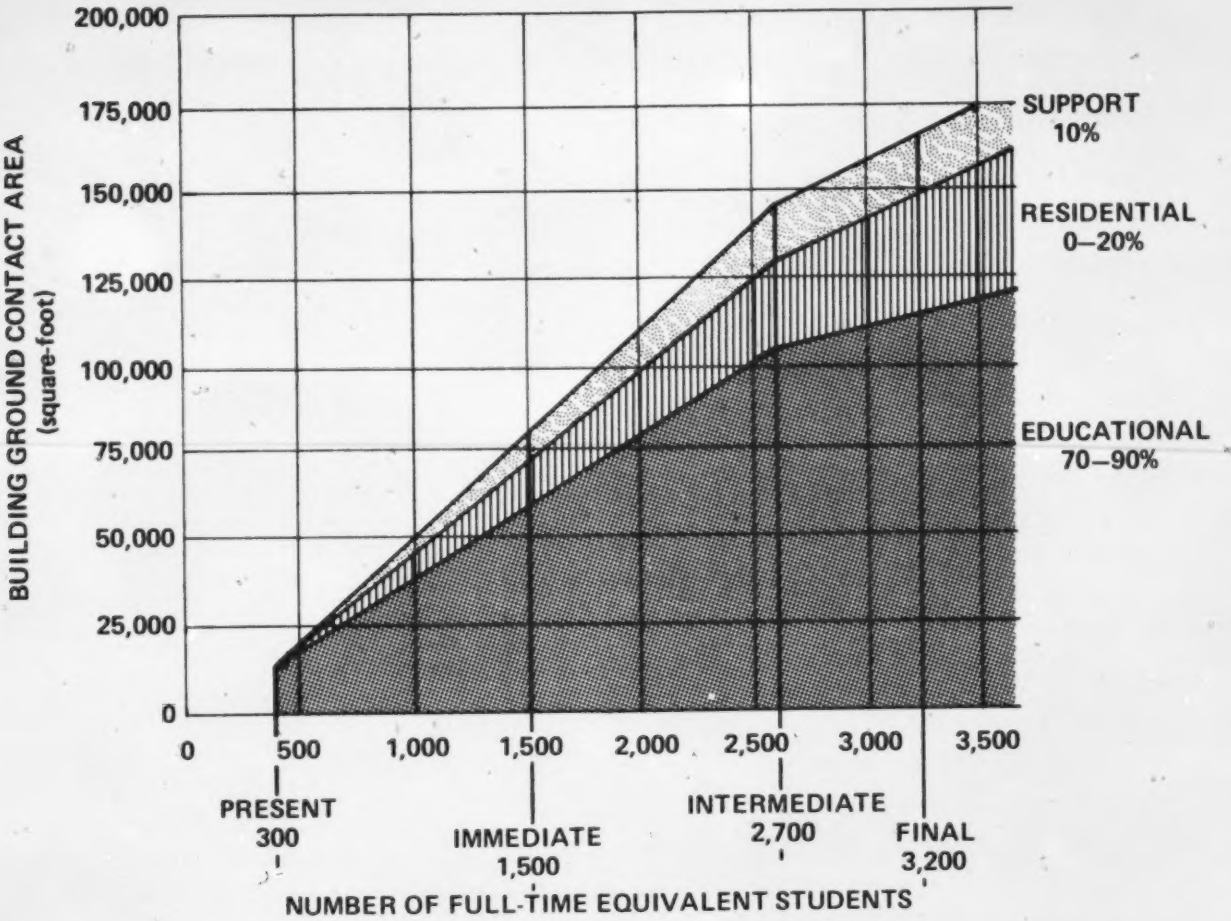


FIGURE 30 – BUILDING TYPES

	Function	Sq. Ft.	Load	Gross Sq. Ft.	Gross Ground Sq. Ft.	Percent Site Covered
1.	Education Space · Classrooms · Administration · Office · Library · Support	125/F.T.E.	3,300 F.T.E.	412,500	165,000	5%
2.	Residential · 20% Campus (Sq. Ft.) · 7% Enrollment	230	470 Resid.	180,000	54,000	2%
3.	Parking · 660 Spaces · 8.33 Acres	.2 Spaces F.T.E.	3,300 F.T.E.	363,000	363,000	11%
4.	Circulation				222,000	7%
5.	Sports · Off Campus · 5.35 Acres	70/F.T.E.	3,300 F.T.E.	233,000	233,000	
6.	Open · Usable · Unbuildable					28% 47%

FIGURE 31 – CAMPUS SIZE BY SQUARE-FOOT FACTORS

5. Pattern of Development

The previous sections of this report have established the background for a schematic design of the Auke Lake Campus site. Objectives, themes and goals have been documented and reviewed, existing site conditions were studied in detail, and the size parameters were roughed out and refined. In this section, this basic information will be applied to the specific study area.

What follows is a general development plan for the Auke Lake Campus site. In this plan, roads, buildings, walkways and other facilities are put into an overall planning organization which should guide the University's building program at Auke Lake for the next few years. The plan is based upon the assumption that the study area will be fully developed to its recommended optimum density. There is no indication how quickly this development will occur but as a starting point, the plan shows the completed campus. Growth can be phased as necessary from the present facilities to the fully developed site as shown.

As in any design solution, the site plan presented here is an attempt to balance many factors and arrive at a comfortable compromise which meets the needs and expectations of the University, the campus user-groups, and the University's neighbors. The plan balances environmental qualities which should be retained, with recommended maximum student loads which respond to the University's statewide goal to educate a larger portion of Alaska's population. Physical features such as slopes, soils and microclimate form the basis for locating and grouping facilities on the campus.

While the recommendations contained in this schematic plan range from the general to the very specific, as a total package the pattern of development is a compilation of the best advice available to the University concerning any new facilities to be placed on the Auke Lake Campus site.

CIRCULATION

The campus-plan element that ties all development together is the Auke Lake Campus circulation pattern——the auto roadways and pedestrian walkways.

Entry Roads

In order to provide a flexible road system for internal campus growth, it is suggested that two entry "gates" to the campus be provided. See Figure 32.

One entry gate would be north of the existing campus buildings, roughly following the existing unimproved roadway and entering onto the Mendenhall Loop Road several hundred feet from its intersection with the Glacier Highway. This new north entrance would be the main entry onto the campus. The sight lines for seeing oncoming traffic at this location are good and the entrance does not conflict with any highway intersections. The entrance also leads to the large parking areas proposed for the site and would make commuter

access to the campus quite easy.

South of the existing campus and roughly following the existing entrance roadway would be a service entry or "back-door" entrance to the campus. For the short term, the entry as it presently exists can be utilized. On the long term, however, it is recommended that the bridge which originally carried traffic across Auke Creek be re-established. See Figure 33.

This bridge and entry road need not have an adverse impact upon the current use of this area as a rest stop and viewpoint park off the Glacier Highway, overlooking Auke Lake and the Mendenhall Glacier. Indeed, with sensitive bridge design, proper site planning, lighting and landscaping, the park can be improved, enhancing its value as a citizen amenity, and the present impossible south campus entry also can be improved to create a safe and visually pleasing entry to the campus.

Roadway System

Long-range plans for highways in the Auke Bay area, according to the Borough Planning Office and State Highway Department, include a new highway which will be an extension of the four-lane, divided roadway that presently ends near the airport. This new roadway will approximately parallel the Mendenhall Loop Road and serve most of the west-bound traffic north of the site. The Glacier Highway is now the major access route into the campus, and most campus users approach the campus along this road south of the site. If and when the new planned highway is constructed, the traffic patterns in the campus area will be reversed and most of the campus users will approach the campus from the north. It is not known at this time whether the Glacier Expressway will be extended around Auke Lake to the north, or whether it will be upgraded in its present alignment around the campus. Either of these options will increase the capacity of the highways in the area and will require improvements to upgrade the entry "gates" into the campus.

The two entry roads into the campus, as shown in Figure 32, would be two-way roads and may be divided by a median into a boulevard configuration. The entry roads would "dead-end" at a plaza which could be a turn-around point, a cul-de-sac "kiss and ride" bus stop or auto drop-off point.

As shown, these roads would provide quick access into the center of the campus on the main entry road, a place to drop-off passengers and a direct, convenient egress.

No through roads are planned on the campus. Most of the auto traffic would use the north entrance and travel in and out of the same gate. Parking would be available near the north gate, although it is assumed that most students will be dropped off either by bus or car. They would disembark at the north entry plaza and their ride could leave quickly by way of the Mendenhall Loop Road. The south entrance probably would be used only by service vehicles, faculty or student residents. At the entry plaza near the south gate, there would be an entrance to a one-way loop road which circles the hill on campus, goes through the parking areas in the northern part of the campus and then exits at the entry plaza near the north gate. Access to this road can be limited by a gate because it is intended only for emergency vehicles and as a student-resident access to the low-density housing units that circle the hill. This loop road should not provide through-campus circulation; the Glacier Highway and Mendenhall Loop Road already serve the cross-campus transportation needs, and the intent of the circulation plan is to keep the impact of motor vehicles on the campus to a minimum.

Parking

As is true with any site planning, the impact of the automobile is probably the foremost consideration when looking at future development. Vehicular circulation and the storage of automobiles are particularly important in any campus design and even more important in the Auke Lake Campus site.

When laying out parking lots in most states, a double-loaded lot will be about 60 feet wide and one can allow about 10 feet for a median between lots. This typical layout is shown graphically in the cross section on the upper half of Figure 35.

In Alaska, as in other states where heavy snowfall must be dealt with, a more typical parking lot requires about a 70-foot width and 15 feet between lots as shown in the lower section on Figure 35. From a planning standpoint, this means that in Alaska, the number of cars which can be parked per square acre is significantly reduced in order to accommodate snow disposal.

In addition, the Auke Lake Campus site has some unique, natural characteristics which require very sensitive handling of parking areas. In order to avoid the look of a sea of roof tops, cars should be parked at a 90-degree angle to the curb, canopy trees should be planted in one parking stall for every 20 stalls, and parking lots should follow the natural contour of the hillside by conforming to

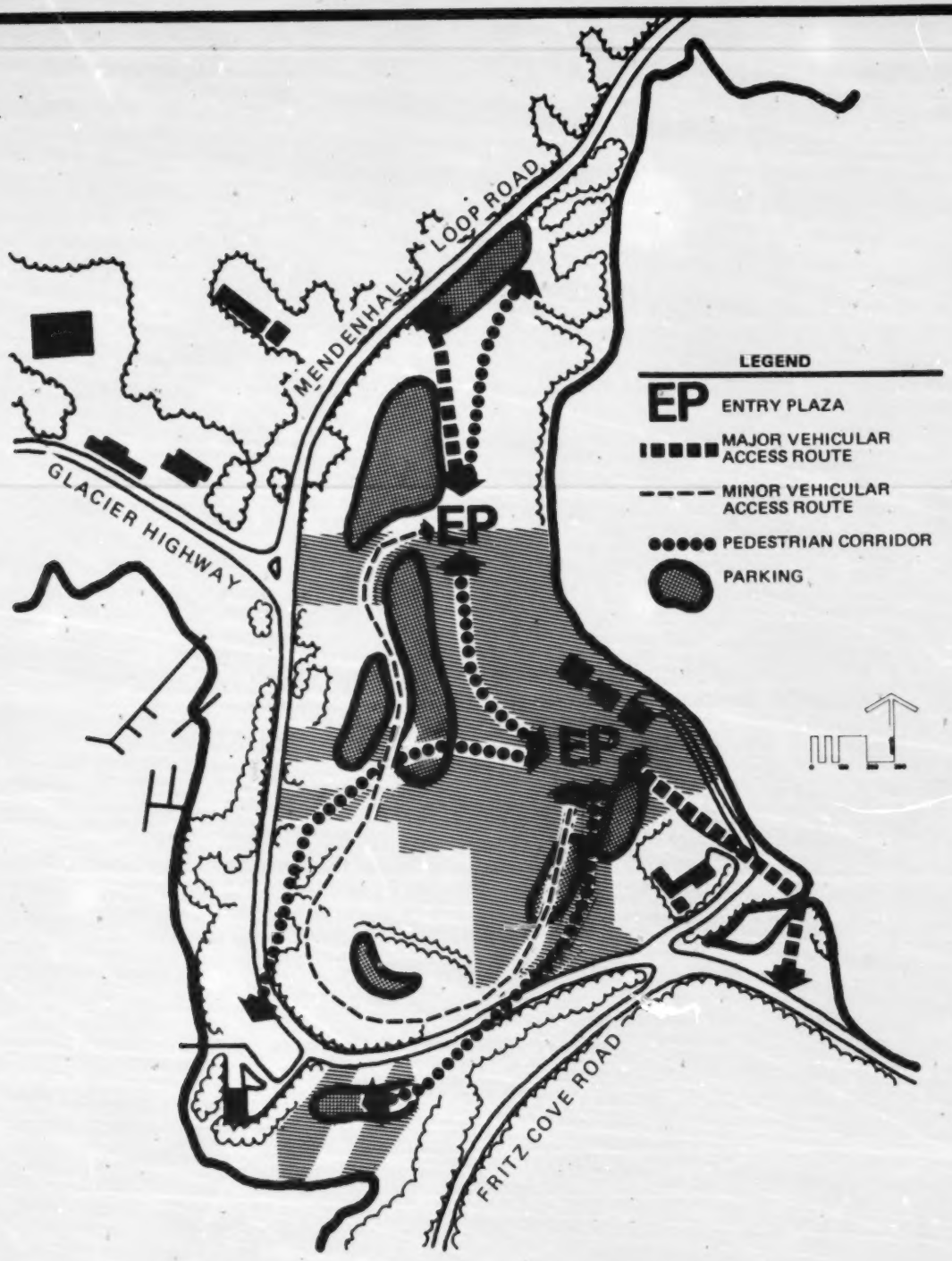


FIGURE 32 – CIRCULATION, PARKING & ACCESS

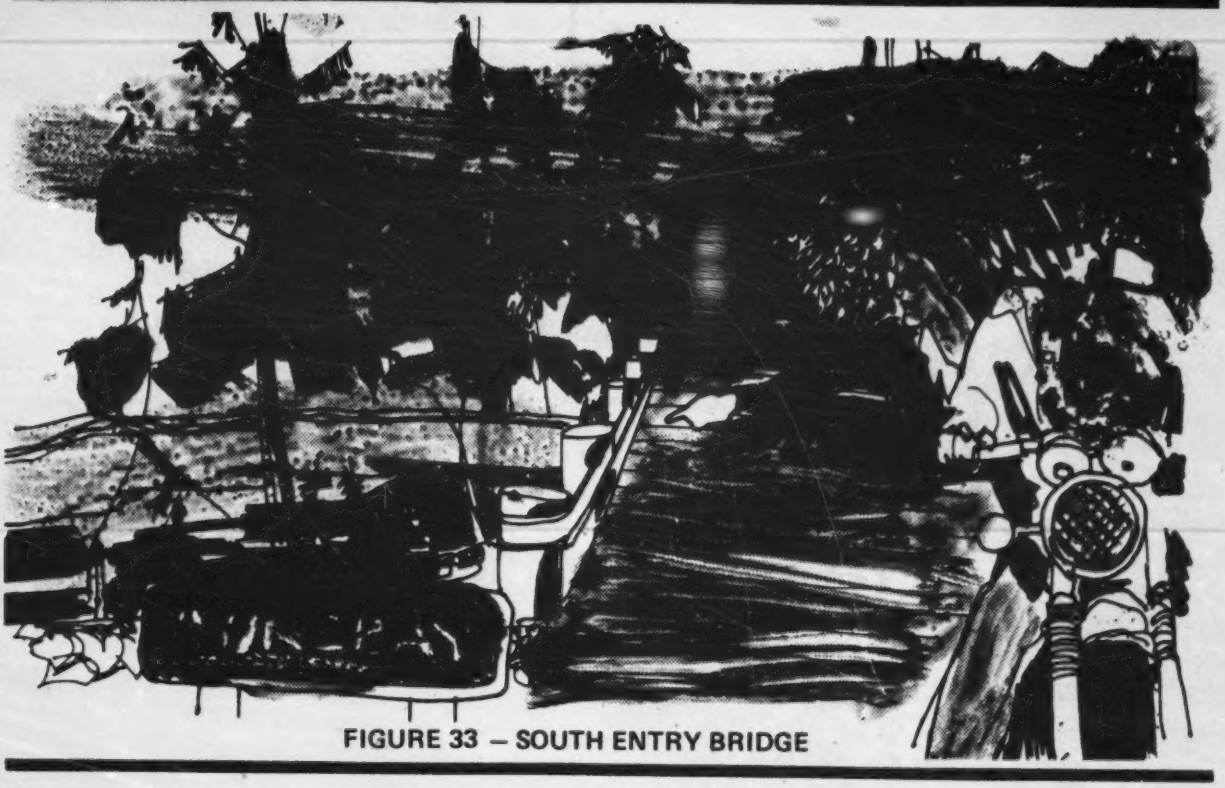


FIGURE 33 – SOUTH ENTRY BRIDGE

the slope of the hill in a terraced effect. These recommendations for parking-lot configurations are shown graphically in Figure 36.

While this parking configuration could create a few problems for snow removal, and it may not be as efficient as other solutions which provide a higher density per acre, this type of parking arrangement is much more in keeping with the character of the Auke Lake Campus site, and in the long run, should prove to be a more satisfactory solution.

In light of the above design configurations for planning purposes, therefore, the following factors were used to determine parking requirements:

- 850 square feet per parking stall, including a minimum, 20-foot center-aisle, maneuvering space.
- 50 cars per acre for most on-grade, open parking areas.
- For every FTE student, 0.2 parking spaces or 11 percent of the site area.

This allocation of parking spaces per student is less than one-half of the usual allocation for suburban and urban campuses in most other states. (Refer back to the pie charts on Figure 27 – Site Coverage.) However, there are several reasons why this parking ratio should be lowered to half what it is on other typical campuses:

- The unique character of the Auke Lake site does not lend itself well to high-density parking, and to devote more than 11 percent of the site to parking does not seem to be an equitable distribution of land uses.
- The steep topography of the site may furnish an opportunity to provide many different types of parking spaces other than the open surface lot. Parking structures can be built into the hillside with auto entrances at grades for both the lower and upper level. Housing units or educational structures could be worked into the hillside with parking under the buildings.
- Parking structures are expensive and only on urban campuses have the cost benefit ratios been favoring parking structures over surface lots. Two-story, low-density lots may be cost-effective and certainly worth considering in order to preserve as much of the natural beauty of the Auke Lake site as is possible; but for planning purposes, the total number of parking spaces on campus has been reduced.
- If a mass-transit system is provided to and from the campus, these parking ratios would be sufficient. The Auke Lake Campus is a commuter

FIGURE 34 – ENTRY PLAZA

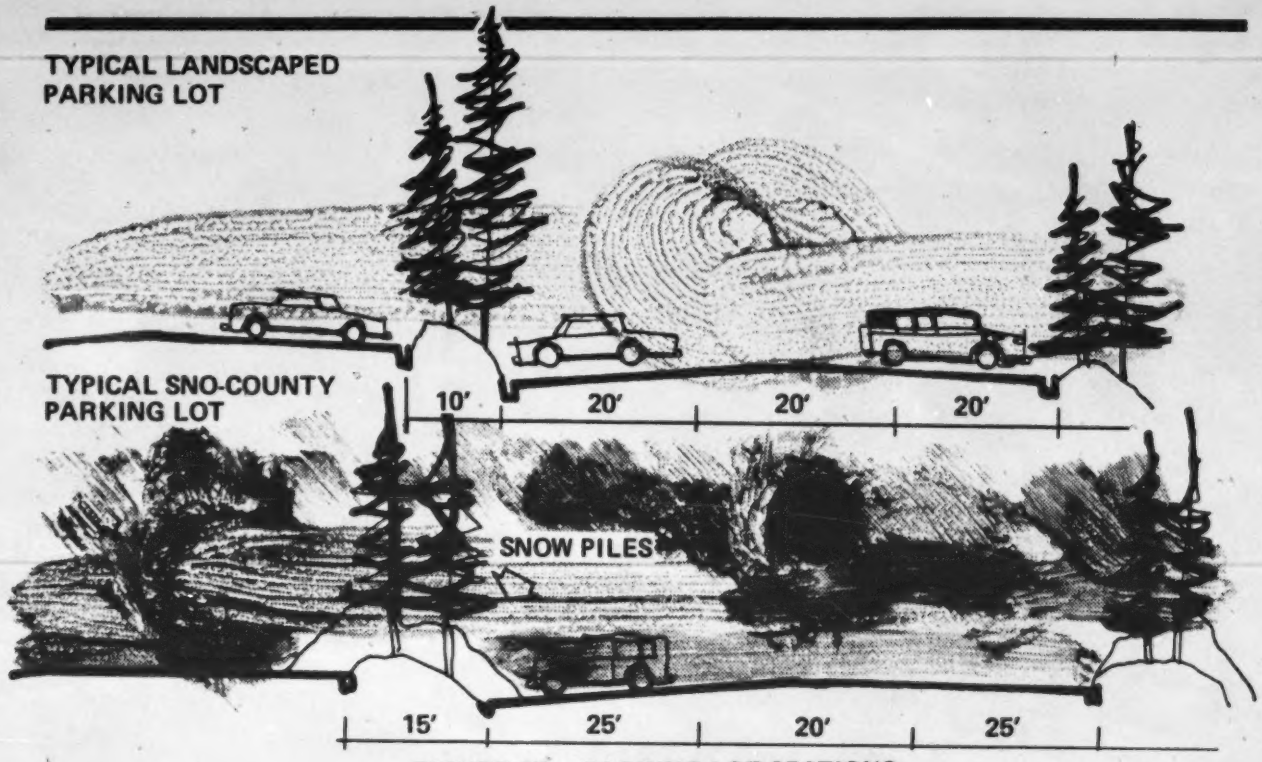


FIGURE 35 – PARKING LOT SECTIONS

campus and will continue to be a commuter campus. Although more resident students will be added as the campus grows, plans could be formulated so that those who do commute can do so by bus and not by auto. Juneau is fairly compact and a shuttle between the Auke Lake Campus and downtown would probably receive heavy use. A bus service could be operated in cooperation with the existing Borough bus service or operated entirely by the University. It is recommended that the University consider as a planning objective the installation of a good mass-transit bus link to reduce parking requirements on the Auke Lake Campus.

In summary, the campus planning, parking-space recommendations are: 1) provide more space per parking stall to facilitate snow removal, 2) eliminate large parking lots by integrating parking spaces into the landscape, 3) provide fewer parking spaces than usual per student, and 4) consider providing a bus service to transport commuting students.

Pedestrian Links

The major pedestrian links planned for the campus are shown in Figure 32. The central part of the academic campus will be fairly compact with a pedestrian axis or corridor between the north and south entry plazas. Insofar as possible, vehicles and pedestrians would be separated and the transfer from wheels to feet would occur mostly at the entry plazas.

In addition to the main campus corridor, major walkways are planned on both sides of the campus hill and north of the entry plaza. The purpose of these walkways will become more apparent as the functions of the different areas are explained later in this report, but in general, these walks will tie housing units or other campus buildings to the central campus.

Buildings on the existing central campus are designed with delightful, covered walkways or porches which provide cover from the rain and an opportunity to enjoy the natural beauty that is so close at hand. It is hoped that this circulation concept can be expanded and extended to new buildings as they are built on campus. Figure 37 is a sketch of a walkway cover which could be used between buildings on the main campus, and could be extended to other areas of the campus.

The covered walkways are, of course, more expensive than open sidewalks, but if properly

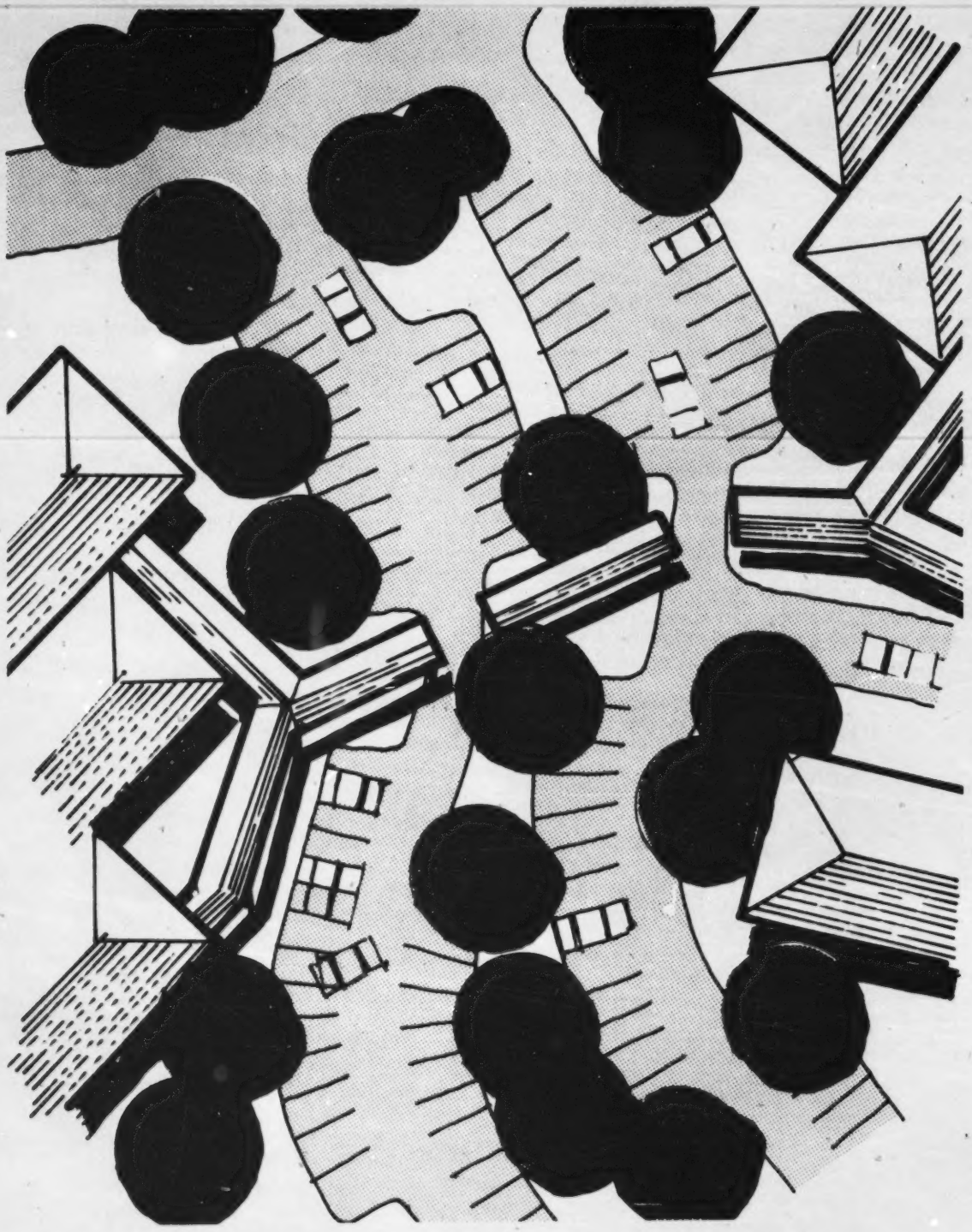


FIGURE 36 – RECOMMENDED PARKING CONFIGURATION

positioned with fences and hedgerows blocking the prevailing winter winds, the covers could pay for themselves by reduced snow-removal costs on campus. The walkway covers must be carefully planned and detailed in order not to impede fire truck access to any campus building. If properly constructed of durable materials, the walkway covers could provide all-weather protection to students while also being a major design element in the new facilities on the Auke Lake Campus.

UTILITIES

A preliminary study of utility requirements for a campus of about 3,200 FTE students was made to provide a temporary planning base. In-depth studies of these requirements will be necessary before a firm utility plan can be presented.

Fresh Water

It seems ironic that, for a site which is nearly surrounded by water, a good source of domestic drinking water is not readily available. Campus wells currently produce very poor quality water and cannot supply a sufficient quantity of even this water to supply the student population anticipated when the campus is fully developed. The problem of supplying fresh water to the campus was addressed in detail in the *Fisheries Science Facility, Master Plan* (KCM, February 1976). Some of the ideas expressed in that report are presented graphically in Figure 38. The main elements of the campus fresh-water system are as follows:

Auke Lake Intakes

The lake appears to be the only water source which would be economically feasible to use at this time. There are aquifers on the Mendenhall River flood plain near Mendenhall Lake and Brotherhood Bridge, but the expense of deep-water wells and several miles of transmission pipeline would be much greater than the development of a water supply from the 175-acre lake adjacent to the campus. Utilization of water from Auke Lake would require permits from the State. Hydrologic studies and careful design must be done so as not to adversely affect the residences already on the lake.

Fisheries Science Facility Use

It is anticipated that the campus will require approximately 450 gallons per minute from Auke Lake. About 45 percent of this water would be used in a "raw" state by the Fisheries Science Facility and the remainder would be treated for campus domestic use. Preliminary studies indicate that this quantity of water removal would not adversely affect either Auke Lake or Auke Creek, and the allocation of this amount of water is well within the maximum amounts the State can permit to be removed from the lake.

Filter and Pump Station

From the new Auke Lake intake, water would be piped to the new Fisheries Science Facility. This building would be the largest water user on the campus. A small filter and pump station to treat water for domestic use on the campus would be built near the Fisheries Science Facility. Preliminary water-quality studies indicate that the treatment system would include filtration, aeration and chlorination.

Reservoir

After treatment, water would be pumped uphill and stored in a reservoir which pressurizes the water-distribution system for the entire campus and provides storage for fire and other peak uses. While elevations for the water system will have to be surveyed carefully, it is anticipated that the reservoir can be mostly underground. This type of reservoir is sketched in Figure 39.

The reservoir cover could serve as a viewpoint out-look over the campus or for some other recreational use such as an outdoor theater or tennis court.

Distribution

Throughout the campus, water for fire hydrants, drinking and sanitary fixtures will be supplied by gravity feed with an occasional booster pump. All lines must be buried deep enough to avoid freezing or be located in heated utilidors.

Sanitary Sewers

Figure 13 shows the location of existing sewer lines within the campus and adjacent community. The on-campus sewage systems which would tie into these sewer lines are shown in Figure 38. The essential elements of the sanitary sewage system are:

Existing Lift Station

Expand and increase the capacity of the lift station which is located just southeast of the existing buildings on campus.

FIGURE 37 – WALKWAY COVER

New Lift Station

As development occurs in the north campus, a new lift station will be required to transport sewage from the lower elevations on campus to the higher sewage line elevations in the Mendenhall Loop Road.

Gravity Feed

All lines to the lift stations will flow by gravity. Lift stations will discharge to the Borough's lines through force mains. Sewers will not be located in utilidors because of health hazards and grade requirements.

Anticipated Load

The Borough charges the existing Mendenhall Sewer Treatment Plant at a capacity of 50,000 gallons per day. When the Auke Lake Campus is totally developed, the estimated load will increase to about 150,000 gallons per day. However, development of the campus will not occur so rapidly as to tax the existing treatment plant in the immediate future.

Storm Drainage

Runoff and drainage present serious problems whenever parking lots and structures are placed on steep sites in an area exposed to large amounts of precipitation as is the case on the Auke Lake Campus. The recommended parking lot configuration, and building massing, help solve some of these problems by having buildings and parking lots follow a "natural" plan; nevertheless, careful, detailed site studies must be done to locate natural runoff and drainage courses, and building locations and drainage systems must be planned accordingly.

The following components make up the proposed storm-drainage system:

Separate from Sanitary

The storm-drainage system should be completely separated from the sanitary-sewage system.

Site Storage

It is assumed that several different means will have to be employed to retain runoff water so that future development will not cause uncontrolled runoff problems. Water may be stored in specially constructed storage ditches, infiltration trenches, detention ponds and parking-lot ponding. The location of detention ponds would have be to planned carefully; these ponds could be used as skating rinks in the winter and water features on the campus during warmer months.

No Treatment

Runoff water will probably not be heavily contaminated and therefore will not require any treatment before release, except the above-mentioned detention devices.

Utilidors

It is recommended that water lines, heating lines, electrical service and communication wires all be underground. In order to accomplish this undergrounding with a certain amount of flexibility and access, it also is recommended that all of these lines be placed in a concrete tunnel or utilidor. A tunnel could be a 2- by 2-foot box section; whereas, an underground corridor is large enough for a person to walk through. By coordinating the location of the utilidor with the main campus walkways, the heat from the utilidor also could keep the snow melted from walking surfaces. Figure 38 indicates the proposed major routes for these utilidors. One major utilidor would follow the main campus pedestrian access from north to south, while another minor utilidor would follow the loop road around the south campus hill. By keeping the utilidors under walkways or road surfaces, they also can be accessed easily for service and new hookups.

Electrical

As Glacier Electric increases its capacity in the Auke Bay area, the University will benefit from the new service and supply. The campus will continue to rely upon Glacier Electric for its electrical power needs. As plans are developed for University growth, the electrical utility will be kept advised in order that it can plan for the increase in demand for power to serve the campus.

It is recommended that the University carefully study its needs for emergency power. Certain critical scientific and computer tasks would be impossible without emergency backup generators to serve critical power needs during power outages. These emergency needs could be provided for on a building-to-building basis, but a better solution might be a central emergency-generator substation to provide emergency power for the whole campus. Standby generators could be powered by engines which utilize the same type oil which is used to heat the campus.

Communications

As buildings and environmental systems become more complex and sophisticated, the need for different communication systems also increases. In

FIGURE 38 – UTILITY DISTRIBUTION

FIGURE 39 – WATER RESERVOIR

addition to telephone service, the campus could be served by any number of other low-voltage systems:

- Central electronic-clock system.
- Fire alarms intertied to the Fire Station.
- Environmental sensors and controls.
- Central mechanical system "control center" at physical plant building.
- Supervisory or intercom systems.
- Closed-circuit T.V. and educational audio-visual instruction lines.
- Security systems and other monitors or alarms.

All of these communication lines could be accommodated in the utilidor network.

Heating

It is recommended that the University consider installation of a central heating plant and a total energy system for the campus. It is difficult to quantify at which point the campus will reach a "critical mass" to make the installation of a central

boiler and physical plant economically justifiable, but future buildings should have equipment that would be easy to attach to the central plant when it is constructed. A campus-wide heating system would have the following characteristics:

Oil-Fired Boilers

This would be the most practical energy source in the Juneau area.

Low-Pressure Steam

Building heat would be distributed through steam lines in the utilidors.

Central Heating Plant

Boilers would be located in a building somewhere near the south entry gate, and would serve the entire campus. Maintenance shops and storage facilities also would be located at the central plant. The Fisheries building and water-treatment system may share a boiler and emergency-power facility, rather than tying in with the central systems.

Steam/Hot Water Exchangers

In each building, steam would be converted into hot water for distribution to fin-tube or other hot-water radiation devices. A central heating plant for the campus buildings, as recommended here, would involve a boiler capacity of about 1300 hp. Also, it is estimated that the Fisheries building would require an additional 100-hp boiler. This boiler capacity would consume about 2,500 gallons of fuel oil per week at maximum operating conditions. Fuel oil would be stored in underground tanks near the physical plant building.

CAMPUS DESIGN CONCEPTS

This section deals with the intangibles involved in planning the Auke Lake Campus: visual density, scale, bulk, texture, height impact and character. It is impossible to discuss each individual design element as if it could be separated from the impact of the whole, because each element affects the visual impact of all others. For clarity, however, in the following discussion, each element is treated separately.

Height and Bulk

Three zones have been established for the Auke Lake site to integrate buildable land criteria and visual impact of the campus from both inside and outside its boundaries. These zones are shown in Figure 40, and described as follows:

Taller Zone

A buildable area that can easily accommodate five-story and taller buildings. A zone in which tall facilities are deemed appropriate because they will produce desirable visual and special effects, if designed properly. They are used against the skyline to enhance orientation and the sculptural form of the campus, to delineate community outdoor areas and focus views. Important also are the considerations of creating potential lateral views off the major vista, and responding to the need to accommodate many concurrent activities in one building.

Medium Height Zone

A buildable area that easily can accommodate two- to four-story facilities. This zone also can accommodate bulkier structures, but scale and vistas must be considered carefully. This area could act as a buffer from a high rise to a low-profile zone. Care must be taken during design that a bulky facility is not objectionable from a distance; abrupt or extreme changes in building height and mass create awkward, unpleasant visual compositions. A bulky building is inappropriate on a steep hillside because it obscures the natural topography. Bulk can prevent views as well as focus them. It is inappropriate if it creates large-structure shadows on public spaces, especially with the lack of sun in Juneau.

Low Height Zone

The use of buildable land that can adequately support one- or two-story buildings. The design intent for buildings in this zone is to achieve the effect of single-story buildings set into nature, similar to the existing character of the Auke Bay community. The impact of scale is one of a human, residential atmosphere.

The overall objective in establishing the height zones is to blend the architectural masses into the topography of the site. From the highways which loop the site and from the entry gates, the buildings should appear to rise up out of the hillside but not overpower it.

Visual Density

At the campus entry, and until one arrives at the entry plaza, the entire impression should be that of a non-urban campus. Low-profile buildings, setbacks and vegetation can be used to heighten this effect. Only at the entry plaza would the increased density of the campus core be apparent.

This core was planned to utilize the most build-

able land most effectively, and combine as many similar activities as the land can tolerate. By creating a high-density core, the greater portion of the campus site can be retained for open space and existing vegetation. Also, this arrangement can promote a close interaction between students, faculty and other users by putting them in close proximity. This central-core design is an attempt to solve a very sensitive design problem: how to create a campus to serve 3,200 FTE students on a site of unique, intrinsic beauty, without completely destroying the amenities that make the character of this campus what it is. Inside the campus core, buildings would be relatively close together to increase efficiency of pedestrian travel and reduce exposure to the elements. There will be a variety of building heights and masses with an overall consistency of character and texture. Spaces between buildings would fluctate, responding to adjacent buildings, circulation, vistas, entries, and needs for transitions from lower to taller structures.

The importance of indoor-exterior space, or the area between buildings, cannot be over emphasized. This is the transition point between the outside world and the enclosed building which is treated ceremoniously in Japanese residences and religious buildings. The present indoor-exterior space surrounding the existing campus structures is one of the most pleasant features of the campus and should be extended to all new buildings.

Character

A commonality of materials among a variety of buildings can go a long way toward giving the entire campus a sense of unity. A palette of common materials must respond to existing structures, both on campus and in the community.

Concrete, giving a sense of permanency, should be used for all building foundations. Heavy timber construction should be used for structural framework with concrete creating a platform, or bench, in the landscape from which the new building 'springs.' In any case, the building structural system should be articulated. Utility systems also should be articulated where possible. Building service functions can be articulated or concealed at the designer's option, providing in all cases for the required flexibility and varieties of function.

As a respite from the possible relative harshness of the structure and utility systems, a warm, wood-tone texture could be used to soften the visual and sensual impact of the building on both viewer and user. Interior finishes should be durable, bright and warm, and enhance the total educational experience in these facilities. Following the pattern which has been established on campus, bright interior colors and graphics are a welcome contrast to the earth-tone building exteriors and typically grey skies in Juneau.

The buildings should respond to natural constraints or advantages of sun angles, solar heat-gain, tree cover, seasons, wind direction and snow loading. The buildings should seem to become part of the total site environment while simultaneously providing the users with a sense of place with respect to University functions. Visual contact with the dynamics of the surrounding environment is a virtual necessity. See Figure 41.

All structures on the Auke Lake Campus have been designed in accordance with the University of Alaska's *Master Design Manual*, "The Blue Book." We assume that all future buildings also will be built using these guidelines. Taken in their most literal context, these guidelines result in what has been somewhat derogatorily referred to as "the standard U. of A. 60x90 box." We doubt that the authors of the University's *Master Design Manual* intended that the basic flexible module structure not be modified in any way. By slightly offsetting upper stories, it will be easier to set the modules into the hillside. By cutting out bays, thus creating alcoves, atriums and architectural rest areas, the interest and diversification of the spaces, so necessary to enjoyable architecture, can be created with little compromise in the functional flexibility of the space. In short, the challenge for future architects who do structures on the Auke Lake Campus is to be inventive and creative within the University of Alaska's module. This inventiveness will require a sophisticated study of factors such as: insulation, exposed surface area, surface-to-volume ratios, vapor barriers and the usability of interior spaces. The benefits to the students and users who must experience the campus' aesthetics, fully warrant this study and should be an added incentive to future design professionals.

An attempt should be made to continue an architectural vernacular for the campus. Basic forms should be gleaned from intrinsic qualities of the surrounding environment, or possibly, something of local historical significance. Some essence of form might be derived from local commerce and industry, or life style. The intent here is to establish a sense of regional architecture similar to San Francisco, Boston, Seattle, Boulder and European cities. The continuity of community architecture in these places has established a sense of character for each of them.

FIGURE 40 – BUILDING HEIGHT ZONES

FIGURE 41 – BRING NATURE INDOORS

Visual Environment

The retention of a maximum amount of natural vegetation with a minimum amount of site disturbance is critical in order to reduce the ecological and psychological impact of development on the Auke Lake site. Building densities will be even lower than those of a typical surburban campus to respond to site amenities, soil conditions and natural conditions. See Figure 42.

The development should complement the existing topography and surrounding landscape forms. Nature can be used to reinforce and enhance planning and design form potentials. Development must be sympathetic with existing community environmental qualities, such as special tree stands, views or drainage basins. Large, expansive parking areas should be avoided as well as large pedestrian spaces. Development must stay back from the lake shoreline to create a buffer zone for ecological and visual impact considerations, as well as to avoid the poor quality soil conditions near the shoreline.

The scale and massing of facilities on the Auke Lake Campus must be studied for their visual impact on the surrounding community, which currently is low-density dwellings or businesses of typically single-story construction.

FIGURE 42 – NEW BUILDING MASSES

FIGURE 43 – ARCHITECTURAL CHARACTER

FIGURE 44 – PLANNING EVALUATION CRITERIA

EDUCATIONAL

- Enhance campus and community interaction possibilities.
- Academic instruction and vocational instruction will be integrated where possible for educational and space planning flexibility.
- Research facilities can be separated from other instructional spaces.
- Student load is site-limited.

CHARACTER

- Development densities will be those associated with a non-urban campus to respond to site amenities, soil conditions and natural vegetation.
- Development must be sympathetic with the existing community environmental qualities by preserving trees and views; layout of parking to avoid large expanses of blacktop and massive pedestrian spaces.
- Development should complement and enhance the natural terrain and greater landscape form.
- Massing and scale of facilities should coincide closely with the existing community structure.

PLANNING

- Most efficient use of land considered as most applicable for high-density use.
- Service and support activities exist in separate zone from major campus activity.
- Community-related facilities should be in close proximity to typical student and faculty services.
- Shorelines are to be kept as natural as possible to act as an ecological and visual buffer for development impact.
- Unique community facilities provided by University should be easily accessible to public.
- Pedestrian circulation is oriented internally to campus.
- Minimum pedestrian circulation between facilities; should be weather-protected.
- Minimize walking time to parking lots and bus stops.
- Student housing within 10-minute walking radius.

CIRCULATION

- Entry to University is safe and identifiable.
- Provide for maximum utilization of bus routes and mini-bus system.
- Campus is oriented externally to vehicular transportation.
- Service and support vehicles easily segregated from general campus circulation.

UTILITIES

- Viable connection to existing utilities.
- Maximum flexibility in timing and amounts of expansion.

Conceptual Development Plan

After studying and evaluating several different concepts for development and growth on the site, several Planning Evaluation Criteria were developed to test the effectiveness of a proposed campus scheme. These criteria are summarized in Figure 44.

The conceptual development plan which is considered most viable to meet the University's growth plans and educational goals is shown in Figure 45. What is shown is the synthesis of all previously discussed concepts for development: utilities, circulation, growth and visual impact. The concepts are phased further in three stages as shown in Figures 46, 47 and 48. The concepts presented in these visual materials may be summarized as follows:

Development: Initial

The north entrance road would be established as the main entrance to the campus. Establishment of this entry road will require negotiating an easement or purchase from the Forest Service; but the creation of this transportation link would be an objective of this first phase of the planning.

Parking lots would be built on the large flat areas near the north entry plaza and south of the central campus. New educational buildings will be constructed on the existing parking lots on campus. The high-density, central core will be reinforced by the development of the first stage of the main campus pedestrian axis. The new buildings in the south end of this central campus core will be devoted to vocational and technical education, while the educational-flexible converted space will tend to be to the north of the central core.

Housing units will be constructed south of the campus and near the north entry plaza. The south entry road will remain in its present configuration. The physical plant will be constructed near the south entrance and initial utility systems established.

Note that the only land acquisition required in this first phase is the Forest Service land for the north entry road. As indicated in Figure 26, this stage in the campus development could accommodate about 1,500 FTE students or almost four times the number of students presently on campus.

Development: Intermediate

The south entry road would be re-aligned across a new bridge. The first stages of the loop road south of the campus hill would be built, and the main pedestrian link between the Fisheries building and central campus would be established. The Fisheries building is shown in its final stage of development with parking and dock facilities totally developed. New, low-density housing units would be added to the south side of campus hill at the north end of the campus, and a new convention and community service center would be developed around the north entry plaza. The Forest Service has expressed an interest in developing a research center in the Auke Bay area, and perhaps this would be a good location for such a facility. The Community Service Center also would house other education/special support functions, such as auditoriums, libraries and student-union services. North and east of the entry road is the first increment of married housing units situated close to the lake, adjacent to the existing residential areas.

This phase of the campus development would concentrate on acquiring parcels in the south end of the campus and provide for about 2,700 FTE students.

Development: Final

Shown in Figures 45 and 48 are the main elements of the Site Development Plan for the Auke Lake Campus. From north to south, the facilities are:

- A residential or married student housing cluster near the northeast corner of the campus.
- The main entry gate to the campus, north off the Mendenhall Loop Road
- Parking and community service and support activities, located around the north entry plaza.
- The central campus core, extending along a pedestrian axis from the north service plaza to the south service plaza Primarily, educational buildings are contained in this central campus core with "educational converted" space in the northern structures and vocational technical space in the southern buildings in the core.
- Along the loop road which rings the campus hill are low-density, student housing units with parking provided under the units.
- The Fisheries building is linked to the central campus by two pedestrian walkways on each side of the campus hill.
- Utility installations include the physical plant and water reservoir south of the campus and the sewage lift stations and utilidor.
- The south entry road will serve as a secondary entry to the campus.

Satellite Campus

The assumption from the beginning of this study was that University growth in the Auke Bay area would be confined to the study area shown in Figure 2. To a certain extent, the definition of this study area was an arbitrary decision, predicated by convenience and the necessity of studying a clearly defined problem with definite boundaries. This artificial confinement of the study area, however, is somewhat unrealistic. Already the University is developing a downtown center and relatively early in this study, it was questioned what activities might best be located elsewhere in order to ease the density pressures on the Auke Lake site.

It is questionable whether the Auke Lake Campus will either need or want extensive athletic facilities. We doubt if there will ever be a full-blown, inter-collegiate athletic program requiring the "sports factories" of schools in other states. We do foresee a good intramural program with an emphasis on participation sports, individual recreation, and passive sports activities. It is recommended that sports facilities for the Auke Lake Campus be located on a satellite campus, outside the study area of this report.

As the campus continues to grow, other satellite campuses will be required. The satellite-campus concept raises questions of the University's growth beyond the Auke Lake study area: *What might be the most logical secondary sites for University satellite campuses?* and *Should the University look at de-centralized growth or essentially a "one campus" concept?* The location, function and use of these other satellite campuses is beyond the scope of this report and should be a subject for further University planning studies.

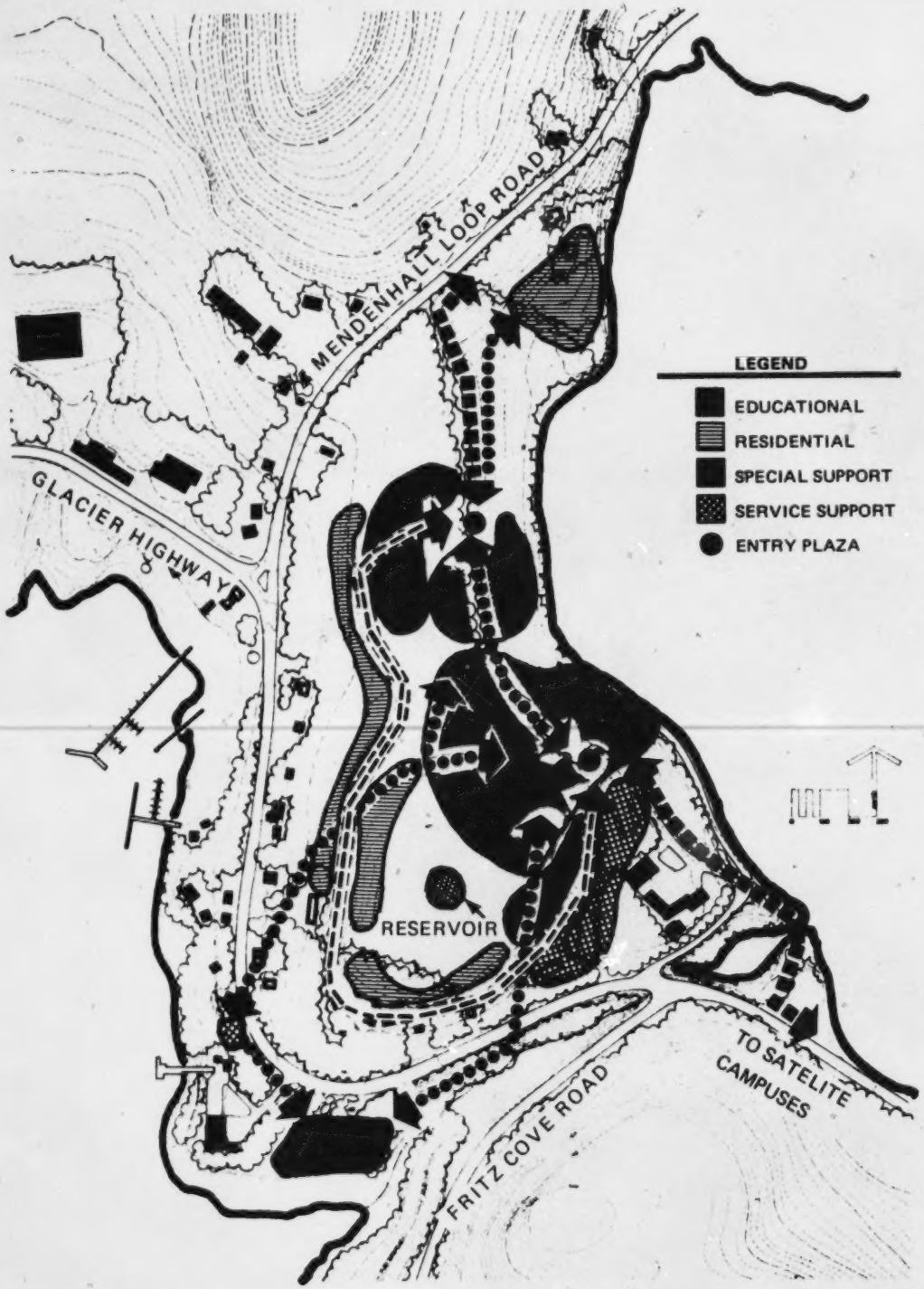


FIGURE 45 – CONCEPTUAL SITE DEVELOPMENT

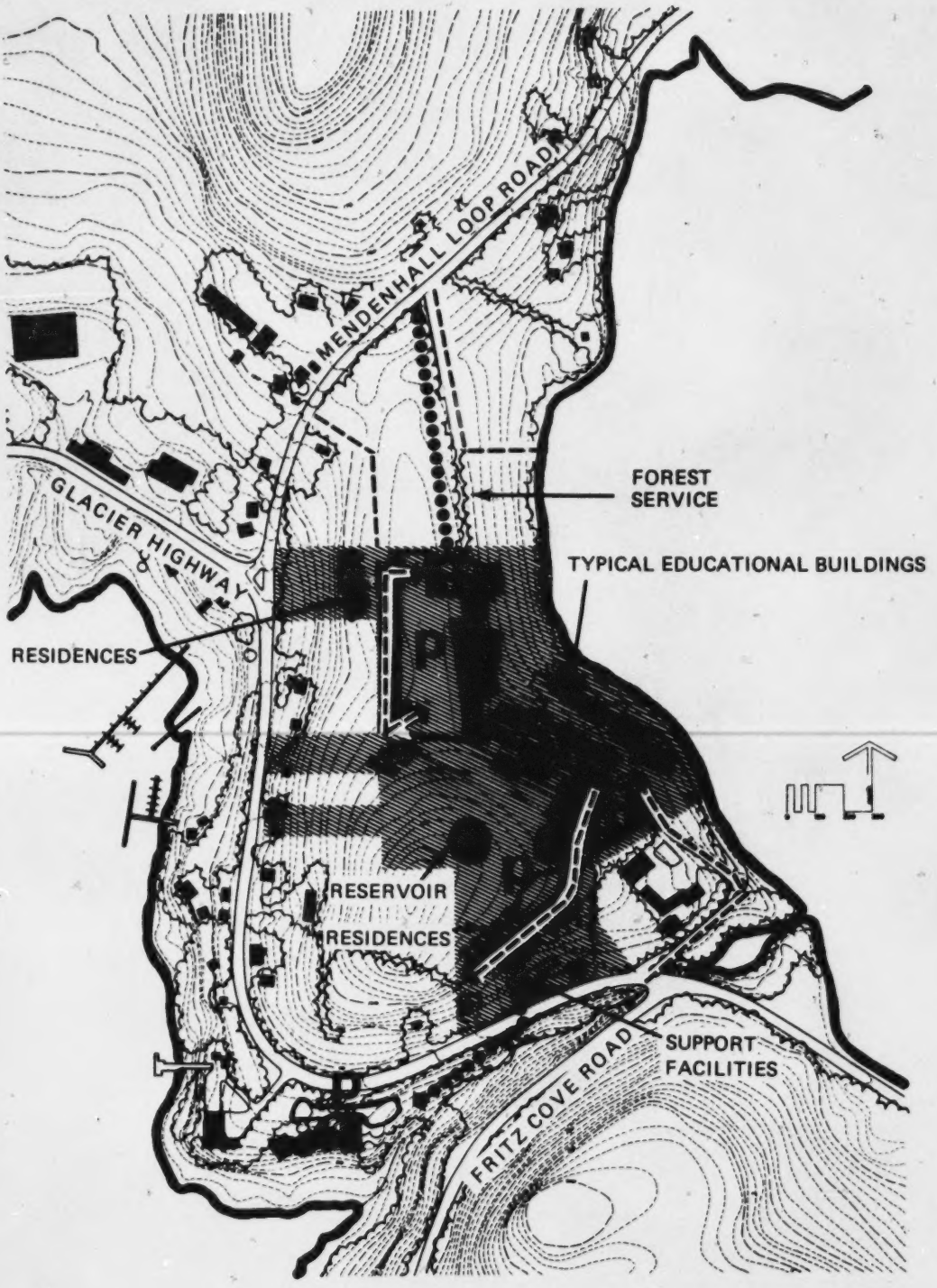


FIGURE 46 – DEVELOPMENT–PRESENT

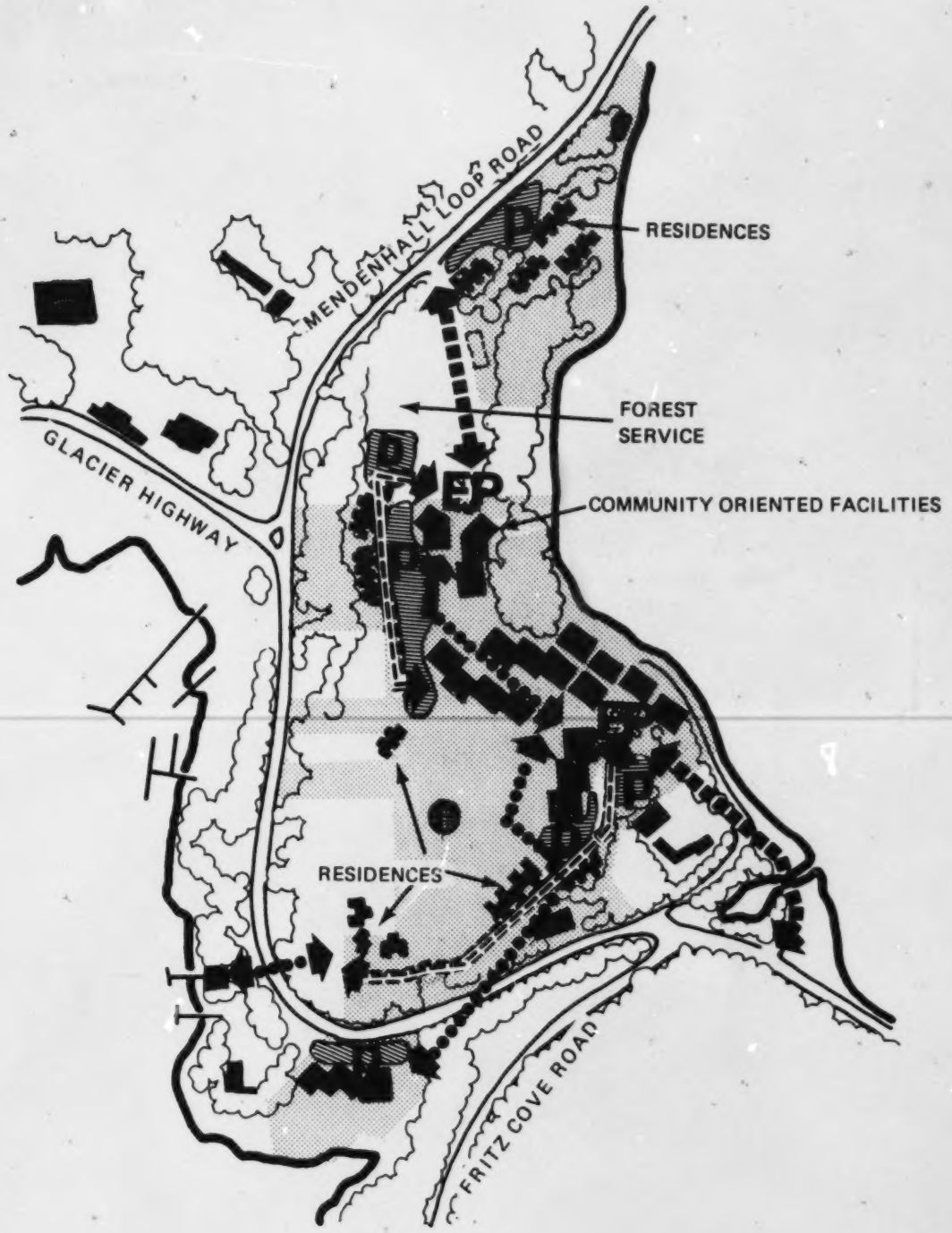


FIGURE 47 – DEVELOPMENT–INTERMEDIATE

FIGURE 48 – DEVELOPMENT–FINAL

FIGURE 49 – SUMMARY RECOMMENDATIONS

- Provide densities lower than typical suburban campuses in Washington.
- Reduce parking spaces and spend equivalent on transit.
- Primary athletic facilities to be off-site.
- Begin immediately to provide housing on the existing campus.
- Provide housing for approximately 5 to 10 percent of student FTE, any need over this to be off-site.
- Develop entrance plaza at north entry first.
- Initiate a thorough parking study for campus, including needs, Borough transit plans, mini-bus, catchment area, etc.
- Campus character to retain a sense of intimate scale similar to residential campus.
- Typical, big-campus exhibition architecture is out of place on this site.
- General site improvements should help enhance surrounding community.
- UAJ should create a design guideline and study the advisability of establishing a design review board.
- Utilities engineering studies are needed.
- Create education specifications for facilities.

SUMMARY RECOMMENDATIONS

Figure 49 outlines the conclusions and recommendations which summarize this report. Most of the recommendations have been detailed in the body of the report, but the following may expand upon conclusions which have not been covered in the report.

Housing

The UAJ can subsidize many students by providing housing for students from outside the immediate Juneau area. Housing also makes the campus more attractive to out-of-state students We recommend, therefore, that the Auke Lake Campus provide a higher percentage of housing and that the University establish the construction of housing units as a high planning priority.

Further Studies

In order to plan logically for campus expansion, this Site Development Plan, in addition to other planning work, should complement the University staff's planning efforts. Of immediate concern would be studies of:

- parking and transportation
- engineering utilities study.

Design Guidelines

In order to install a certain amount of continuity in design decision-making, and insure the enforcement of aesthetic policy, the University should consider establishment of a design review process. This process would entail the drafting of a Design Guideline document, establishment of rules, and appointments of a design review board. Approval from this board would be required for all new construction The board would judge projects for conformity with the Design Guidelines. The design review process is not without its faults and detractors, but the University should investigate this technique for insuring the continuing quality of the Auke Lake Campus design.

Educational Specifications

As part of the continuing, staff planning-services building, "ed specs" should be written for new facilities. Ideally these specs should be based upon user group questionnaires, space allocation studies, cost-benefit ratios and demand curves. As the Auke Lake Campus grows, staff planning will have to increase in personnel and complexity.

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